

# Keio University Annual Report on Research Activities 2007–2008

Unflagging Generation of Knowledge:  
Independence and Collaboration in Global Society



Keio University



The year 2008 marks a momentous milestone for Keio University: the 150th year since its establishment. The history of Keio University parallels the 150 years since Japan opened its ports to the rest of the world. During this historical landmark year, Keio University is taking a resolute step forward into the next 150 years, proud of the substantial role that it has played in the modernization of Japan.

In April 2008, the University established a Faculty of Pharmacy and a Graduate School of Pharmaceutical Sciences, as well as two independent Schools: the Graduate School of System Design and Management, and the Graduate School of Media Design. Keio University is applying its comprehensive capabilities and the synergistic effects of its diverse activities to dramatically increase the quality of education offered.

Based on a vision of creating "intellectual value" and opening up diverse new fields, Keio University is striving to become a university with an elliptical structure that embodies a dynamic balance between two focuses: maintaining a distance from short-term social and economic trends (independence) on the one hand, and active engagement with real-world society (coexistence) on the other.

In addition to conducting academic research of the highest standard, Keio University will transmit the content and results of its research, based on an awareness of the increasing demand for universities to contribute to society, for example through collaboration with partners in society, industry, government, and academia.

Publication of the "Annual Report on Research Activities 2007-2008" - the sixth since the report's inception-is one aspect of this effort. Like last year, the theme of the report is "transmitting research results on an international scale." In addition to statistical data, we have included topics and content that will enable readers to gain a clearer understanding of our current research activities and related trends.

Keio University has embarked on a new challenge to become one of the world's leading universities. We hope that this report will provide 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

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# 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 "Gakujutsu Sendo (leadership for scientific progress)", the University aims to make significant contributions to international society in the 21st century through original and creative academic research. Keio University promotes numerous advanced research projects at six campuses: Mita, Hiyoshi, Yagami, Shinanomachi, Shonan Fujisawa, and Shiba Kyoritsu. Traditionally, Keio University has been deeply involved in collaborative activities between industry, government, and academia. Activities such as commissioned research, 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 Keio Incubation Center (KIC), the Intellectual Property Center (IPC), the 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 campuses of Mita, Hiyoshi, Yagami, Shinanomachi, Shonan Fujisawa, Shin-Kawasaki, and Tsuruoka each have an Office of Research Administration. Each office supports research oriented to the researcher, acts as an on-campus contact point for external organizations, and promotes research 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 offer 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.

### Keio Advanced Research Centers (KARC)

Supports advanced, interdisciplinary research activities

In recent years, Keio University has felt an increasing need to create a new combined research center (or education and research center) based on cooperation between diverse fields. To respond to this need, the Keio Advanced Research Centers (KARC) was established on February 1, 2007. KARC spans across all university faculties and graduate schools to facilitate the establishment and management of research centers, the mobility of their personnel. It thereby stimulates the formation and speed of interdisciplinary research activities.

### 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.

### 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.

### Keio Incubation Center (KIC)

Supports incubation activities throughout Keio University

The aim of the Incubation Center is to be an organization that supports and advances new business creation together with industry at each campus, from the preliminary stage of education and research to the return of research achievements to society. The Incubation Center 1) plans and examines systems and mechanisms (funding support schemes, etc.) that are necessary to support new ventures, 2) formulates rules and guidelines for incubation activities, 3) conducts surveys and collects statistics for incubation activities and ventures originating from the University, 4) builds and maintains internal and external incubation support networks, 5) and supports the management of incubation facilities. In addition, the KIC provides public relations, information on entrepreneurial education programs, and contest management for incubation activities and ventures originating from the Keio University.

### Center for Research Promotion (CRP)

Coordinates collaboration between industry, government, and academia

The Center for Research Promotion (CRP) plays the role of general producer for planning and promoting integrated and strategic research efforts based on collaboration between industry, government and academia. In addition, the CRP serves as a gateway to coordinate collaboration between companies, universities, and research institutes in Japan and overseas. CRP is responsible for advancing interdisciplinary research and comprehensive research collaboration. Specifically, the CRP advances joint research projects through discovering and combining university resources that match business needs. It supports the application process to obtain public funding on research themes together with industry. The CRP manages university research grant-in-aid to support joint research between industry, government, and academia. Through symposiums, it also advances exchange and communication of research results with external organizations. These activities are advanced through discussions with the CRP Advisory Board.

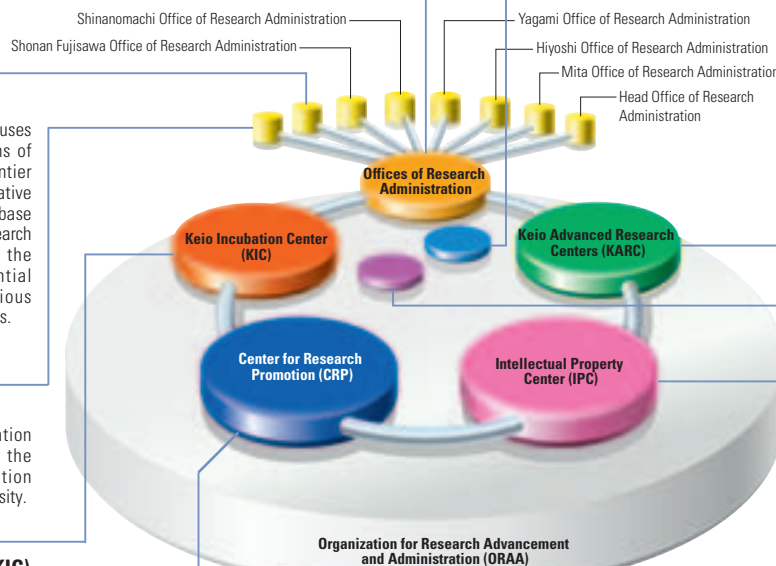
### Research Ethics Committee

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.

### 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 range of responsibilities, including management and operation of intellectual property generated by the University to promote 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.



# 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.ora.a.keio.ac.jp/index-e.html>  
E-mail: [ora-a-jimukyoku@adst.keio.ac.jp](mailto:ora-a-jimukyoku@adst.keio.ac.jp)

"I'm thinking about doing joint research with Keio University. Who should I contact first?"  
"How do I obtain the Annual Report on Research Activities?"  
"I'd like to receive information on research-related events by email."

## Center for Research Promotion (CRP)

<http://www.crp.keio.ac.jp/en/index.html>  
E-mail: [crp@info.keio.ac.jp](mailto:crp@info.keio.ac.jp)

"I'd like to know information about the intellectual property owned by Keio University."  
"I'd like to receive advice on technology transfer (licensing between university and company)."  
"I'd like to participate in new technology presentations, seminars, and forums hosted by the Intellectual Property Center."

## Intellectual Property Center (IPC)

<http://www.ipc.keio.ac.jp/english/index.html>  
E-mail: [toiawasesaki-ipc@adst.keio.ac.jp](mailto: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](mailto:karc-jimu@adst.keio.ac.jp)

"I'd like to invest in a venture companies established by Keio University." "I'd like to set up operations in an incubation facility." "I'd like to receive advice on starting up a venture company."

## Keio Incubation Center (KIC)

<http://www.kic.keio.ac.jp/index.html>  
E-mail: [incu-jimu@adst.keio.ac.jp](mailto: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](mailto:liaison@educ.cc.keio.ac.jp)

"I'd like 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](http://www.k-ris.keio.ac.jp/index_en.html)

"I'd like to learn about the research and education activities in pharmacology at the Shiba Kyoritsu Campus."  
"I'd like to advance joint research or contract research based on a collaborative effort in pharmacology."

## Shiba Kyoritsu Campus

<http://www.pha.keio.ac.jp/>  
E-mail: [skc-shien@adst.keio.ac.jp](mailto:skc-shien@adst.keio.ac.jp)

"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 SFC Open Research Forum (ORF)."

## Keio Research Institute at SFC

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

"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

### FY2007 (April-March)

DD/MM/YY	Event	Host	Site
18/04/07	The 18th Keio Innovation Network	IPC	Mita
2-3/07/07	The 14th Venture Private Conference	IPC	Mita
20/07/07	NTT-Keio University Joint Symposium "Ubiquitous Leadership: The Future of Industry-Academia Collaboration"	CRP	Mita
23/07/07	The 1st International IPC Industry-Government-Academia Collaborative Seminar	IPC	Mita
25/07/07	The 17th Keio Innovation Network	IPC	Mita
07/08/07	"Brilliant and Exciting Science: Welcome to the University Lab" - KAKE/NIH: Returning and Diffusing the Achievements of Research	Head Office of Research Administration	Shin-Kawasaki Town
2-4/08/07	Keio Summer Bio Camp 2007	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
6-7/08/07	KEIO International Symposium Photonics and Molecular Therapy	Drs. Obara and Okano	Shinanomachi
20-22/08/07	Summer Bio College 2007	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
27/09/07	The 2nd International IPC Industry-Government-Academia Collaborative Seminar	IPC	Mita
27/10/07	International Symposium "Individualized Cancer Therapy Based on Development of Minimally Invasive and Innovative Therapeutic Methods"	Program Leader: Dr. Y. Kawakami	Shinanomachi
17/11/07	Open Campus 2007 (introducing K' Research Project)	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
17/11/07	K' Open Seminar	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
22-23/11/07	SFC Open Research Forum 2007	Keio Research Institute	Roppongi Hills
28/11/07	The 18th Keio Innovation Network	IPC	Mita
29/11/07	The 21st Century Center of Excellence (COE) Program: International symposium 2007 "Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology"	Program Leader: Dr. H. Okano	Shinanomachi
30/11/07	JSPS Core to Core Program Symposium Lund University and Keio University "Collaboration of Research Centers for Stem Cell Biology and Regeneration Medicine"	JSPS Core to Core	Swedish Embassy
03/12/07	The 3rd International IPC Industry-Government-Academia Collaborative Seminar	IPC	Mita
4-5/12/07	The 12th Keio Medical Science Prize Award Ceremony, Commemorative Symposium	Keio University Medical Science Fund	Shinanomachi
05/12/07	The 8th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2007	KLL	Tokyo International Forum
12/12/07	Hiyoshi Research Portfolio 2007 Exhibition	HRP Steering Committee	Hiyoshi
13/12/07	The 4th University-Industry Collaboration Forum by kanto kansai 10 private universities "Innovation and Inter-University Collaboration"	Kanto-Kansai 10 private universities	Kwansei Gakuin Hall
25/01/08	Incubation Seminar "Mechanisms and establishment of LLP and LLC."	Incubation Center	Yagami
30/01/08	The 19th Keio Innovation Network	IPC	Mita

### FY2007 (April-March)

DD/MM/YY	Event	Host	Site
01/02/08	The 4th International IPC Industry-Government-Academia Collaborative Seminar	IPC	Mita
02/02/08	K' Open Seminar	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
02/02/08	SME Business Matching	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
06/02/08	The 4th Keio University Advanced Science and Technology Symposium "The Future of Interdisciplinary Drug Development Research through the Integration of Basic Medicine and Clinical Medicine"	Center for Research Promotion & Kyoritsu University of Pharmacy	Mita
7-8/2/08	The 15th Venture Private Conference	IPC	Mita
07/03/08	International IPC Symposium on Industry-University-Government Collaboration "Looking Ahead to the Next 10 Years about Industry-University-Government Collaboration"	IPC	Mita
13/03/08	The 20th Keio Innovation Network	IPC	Mita
25-27/03/08	Spring Science Camp 2008	Japan Science and Technology Agency	Tsuruoka Town
27/03/08	The 5th International IPC Industry-Government-Academia Collaborative Seminar	IPC	Mita

### FY2008 (April-March)

04/10/08	Open Campus 2008 (introducing K' Research Projects)	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
04/10/08	K' Open Seminar	Shin-Kawasaki Frontier Research and Education Collaborative Square	Shin-Kawasaki Town
22/10/08	Intellectual Property Seminar	IPC	Yagami
30/10/08-01/11/08	The 3rd Metabolome Symposium	Institute for Advanced Biosciences	Tsuruoka Town
November	The 5th University-Industry Collaboration Forum by kanto kansai 10 private universities	Kanto-Kansai 10 private universities	Waseda University
14-15/11/08	Hiyoshi Research Portfolio 2008 Exhibition	HRP Steering Committee	Hiyoshi
15-16/11/08	Transporter Workshop	Japan Transporter Research Association	Tsuruoka Town
21-22/11/08	SFC Open Research Forum 2008	Keio Research Institute at SFC	Roppongi Hills
19/12/08	The 9th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2008	KLL	Tokyo International Forum
Oct. to March	Incubation Seminars	Incubation Center	Each campus
Oct. to March	Intellectual Property Seminars	IPC	Each campus
Oct. to March	New Technology Presentation Seminars	IPC	Mita
March	International IPC Symposium on Industry-University-Government Collaboration	IPC	Mita
mid-March	Spring Science Camp 2009	Japan Science and Technology Agency	Tsuruoka 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.

# Center for Research Promotion

## Promoting Research Collaboration and Transmission to Society

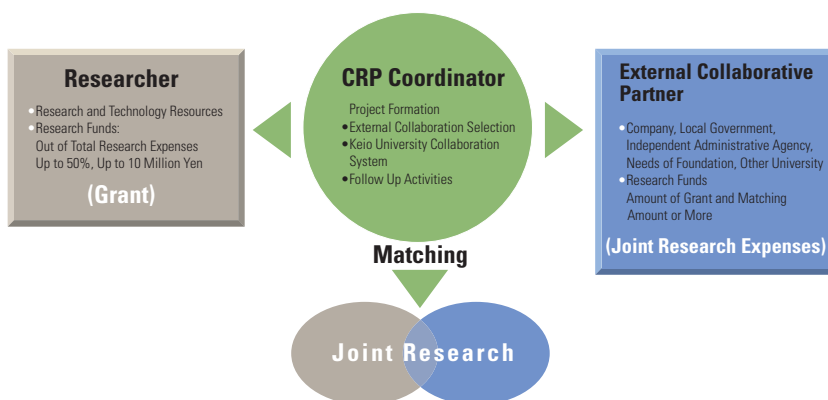
The Center for Research Promotion plays a major role in planning and advancing overall researches based on collaboration between industry, government, and academia. The CRP manages research fund systems to encourage the use of internal resources in technology and research for societies and it sponsors symposiums. From the fiscal year 2008, the thoroughly revised fund system will support new projects between industry, government and academia as a grant system for external collaborative research.

Public symposiums are very important as they serve to introduce the research efforts of Keio University to a wide audience. At the same time, they give Keio University members an opportunity to meet representatives from industries and governments.

### 1 Grant System for External Collaborative Research

The new grant system for external collaborative researches, set up by the CRP in 2008, will promote the use of Keio University's resources in technology and research to form collaborative projects with a broad range of external organizations (e.g. company, local government, independent administrative agency, foundation, other university). The grant system will support the launch of joint research to tackle important social and technological issues.

Different from preceding systems, the new grant system will promote joint research through a matching fund arrangement with external collaborative organizations. A CRP Coordinator will prepare the framework for joint research, carry out follow-up activities, and actively participate in project formation. In particular, with an emphasis on innovativeness (e.g. new theme, new collaboration partner, new research team), project proposals will be most welcomed from young researchers. The grant system will be expected to facilitate new collaborative efforts between industry, government and academia.



### 2 Research Presentations on Selected Subjects in 2007 under CRP's Researcher Grant Program

Through combining advanced researches in multiple diverse fields, the purpose of CRP research funds is to discover themes that integrate different fields and to promote interdisciplinary research.

In 2007, the CRP invited researchers to submit project proposals on "human amenities" as the theme toward improving the quality of life (e.g. society, the environment, technology, medical care) and sustaining the prosperity and comfort for people. The CRP accepted four proposal applications.

The project period ended in June 2008 with a research presentation workshop in the presence of the CRP Advisory Board. Even though the research period was only one year, research papers and patent applications were generated. The main purpose of the system has thus been achieved. These research efforts will continue to develop and their results will be used for the benefits of societies.

The researcher grant system has helped to launch projects that may not have been able to secure funding and it has laid the groundwork for future efforts in interdisciplinary researches. The CRP fund system completed its mission in 2007. Its role will be inherited by other funds for the advancement of education and research.



Research Announcement (2008/6/5)

#### Selected Subjects in 2007 (The duty position at the time)

(\*: indicates research representative)

Theme	Name, Affiliation, Position	Name, Affiliation, Position
Interdisciplinary Approach to Gerontology Research for Successful Aging in a Rapidly Aging Society	• Nobuyoshi Hirose, Assistant Professor, School of Medicine	Michiyo Takayama, Assistant Professor, School of Medicine
	Jyuko Ando, Professor, Faculty of Letters	Midori Takayama, Associate Professor, Faculty of Science and Technology
	Yasumichi Arai, Assistant Professor, School of Medicine	Ryoko Fukuda, Assistant Professor, Faculty of Environment and Information Studies
	Kikuko Ohta, Professor, Faculty of Nursing and Medical Care	
An Interactive Robot for Encouraging Our Social Behaviors	• Michita Imai, Associate Professor, Faculty of Science and Technology	Mitsuhiro Okada, Professor, Faculty of Letters
	Ren Ohmura, Assistant Professor, Faculty of Science and Technology	Midori Takayama, Associate Professor, Faculty of Science and Technology
Development of Science and Technology for Realizing Clean, Beautiful, and Bright Living Environment and Its Total Evaluation	• Kouichi Asakura, Associate Professor, Faculty of Science and Technology	Riichi Miyake, Professor, Graduate School of Media and Governance
	Takaaki Ishigure, Assistant Professor, Faculty of Science and Technology	Akiko Watanabe, Associate Professor, Graduate School of Media and Governance
	Takaaki Kumakura, Professor, Faculty of Science and Technology	Koki Akutsu, Graduate Student, Graduate School of Science and Technology
	Eisuke Nihei, Assistant Professor, Faculty of Science and Technology	Akihiro Kuroda, Graduate Student, Graduate School of Science and Technology
Establishing a new Community Development Workshop using Virtual Space	• Susumu Osada, Associate Professor, Faculty of Economics	Masanao Takeyama, Associate Professor, Faculty of Economics
	Takaaki Kumakura, Professor, Faculty of Science and Technology	Yasushi Nakano, Professor, Faculty of Economics

### 3 Cooperation Agreement with Kyoto University and Partnership Fund

In September 2007, Keio University and Kyoto University signed a comprehensive cooperation agreement covering research, education and international exchange.

Under the concept of contributing to people, society and the earth, the agreement deepens cooperation through an emphasis on joint research in areas of on going achievement (e.g. medicine, life science, economics, and earth science). At the same time, the agreement aims to develop human resources through mutual exchange between young researchers. Both universities have a self-driven independent spirit. Keio University focuses on practical science while Kyoto University emphasizes on fundamental researches. The agreement is expected to generate synergies between contrasting systems (public and private) and cultures (national capital and historic city). Through the sharing of Keio's SOI Asia and Global Studio and Kyoto's overseas branches, the two universities can establish a network of advanced learning that covers most of Asia. This network will facilitate researches on Asia and speed up the pace of information exchange.



Signing of Cooperation Agreement

The Keio-Kyoto Education and Research Collaboration Fund is expected to be established in 2008. The fund is managed through donations from industry and external organizations that support the research and education activities of both universities. The fruit of fund is applied to collaborative activities of both universities. The fund is expected to facilitate research and education activities that will benefit society in the future.

### 4 Transmission of Research Activities to Society

The 4th Keio University Advanced Science and Technology Symposium was held at North Hall, Mita Campus on February 6, 2008. The theme was "The Future of Interdisciplinary Drug Development Research through the Integration of Basic Medicine and Clinical Medicine."

With a population that is aging faster than other country, the importance of health and medical care in Japan will increase. At Keio University, the School of Medicine, graduate schools, and nearly all campuses place a strong emphasis on education and research related to life science and medical care. After a merger with Kyoritsu College of Pharmacy, Keio University established the Faculty of Pharmacy and the Graduate School of Pharmaceutical Sciences. Based on an integrated research system spanning a wide range of disciplines (e.g. medicine, pharmacology, science and engineering, sociology), the University expects to see unprecedented research results in the field of life science. Based on this background, the symposium focused on medical care and life science.



Symposium Lecture

The symposium invited 10 researchers who are active on the frontlines of basic medicine, clinical medicine, and pharmacological studies to give lectures. The talks were of great interest, covering life science applications, current efforts at the School of Medicine, the insurance system and new technology applications, regenerative medicine, genome science, metabolomics, other advanced research topics, and how to apply them all in the development of new drugs. There was also a special lecture on the pharmaceutical industry today and tomorrow and what to expect from the pharmacy education of industry. Over 200 people attended the event. Outside the lecture hall, Kyoritsu University of Pharmacy set up an exhibit to introduce its research efforts. This popular exhibit generated a lot of excitement over the new faculty and graduate school.

#### The 4th Keio University Advanced Science and Technology Symposium "The Future of Interdisciplinary Drug Development Research through the Integration of Basic Medicine and Clinical Medicine."

Opening comments	Yuichiro Anzai, President, Keio University
Opening comments	Taro Nishimura, Vice President, Keio University
Keynote Speech: Pharmacy Education and Pharmaceutical Research as a Medical Profession under New Pharmacy Education Systems.	Masataka Mochizuki, Ph.D., President, Kyoritsu University of Pharmacy
From Bench and Bedside: Need for Systematic Approach Transferring New Medical Evidence to The Real World in Japan	Toru Takebayashi, Professor, MD, MPH, DMSc, School of Medicine, Keio University
Health Economics and Life Science	Shigeru Tanaka, Professor and Associate Dean, Graduate School of Business Administration, Keio University
Regeneration of the Heart Using Stem Cell Biology and Tissue Engineering	Keiichi Fukuda, MD, Ph.D., Professor and Chair, School of Medicine, Keio University
Role of NF- $\kappa$ B Activation in the Anti-Apoptosis and Cytokine Signaling.	Tadashi Kasahara, Ph.D., Professor, Kyoritsu University of Pharmacy
Expression and Function of Drug Efflux Transporters.	Yoshikazu Sugimoto, Ph.D., Professor, Kyoritsu University of Pharmacy
Novel Separation Systems and Drug Delivery using Functional Polymers.	Hideko Kanazawa, Ph.D., Professor, Kyoritsu University of Pharmacy
Retrotransposon Silencing Mediated by RNA Silencing Mechanisms.	Mikiko C. Shiomi, Associate Professor, University of Tokushima, JST CREST
New Approach for Drug Discovery Based on Metabolomics	Tomoyoshi Soga, Professor, Faculty of Environmental Information Studies, Institute for Advanced Biosciences, Keio University
Discovery and Development of Anti-Inflammatory Agents Using Chemistry, Biology, and Medicine	Kazuo Umezawa, Professor, Faculty of Science and Technology, Keio University
Prospective Isolation, Identification and Analysis of Mouse and Human MSC	Yumi Matsuzaki, Associate Professor, Center for Integrated Medical Research, Keio University
Human Metabolomic Systems Biology: Its Application to Medical and Pharmaceutical Sciences	Makoto Suematsu, MD., Ph.D., Dean, Professor and Chair, School of Medicine, Keio University
Current Status and Future in the Pharmaceutical Industry	Osamu Nagayama, President and CEO, Chugai Pharmaceutical Co., Ltd.

### 5 Medicine-Engineering Research Exchange

The CRP promotes interdisciplinary collaboration within the University. In 2007, the CRP sponsored a poster exhibit and presentation event to introduce research activities and achievements of the Faculty of Science and Technology to members of the School of Medicine at the Shinanomachi Campus. A total of 21 researchers presented research results including members of Kyoritsu University of Pharmacy. Held from October 10 to 12, 2007 the event was attended by Masataka Mochizuki, the former President of Kyoritsu University of Pharmacy, and some 80 other guests. It gave researchers in medicine, engineering and pharmacy an opportunity to meet and exchange ideas.



Research Workshop

# Intellectual Property Center

## Technology Transfer Efforts

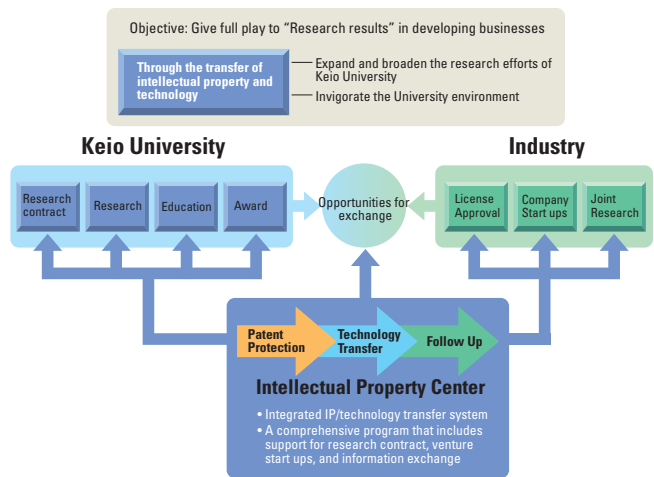
Knowledge created at the university is returned to society through the traditional vehicles of education and academic presentation. In recent years, universities across Japan have been firmly establishing a third vehicle of return, that is, the conversion of research results into commercial products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

As a reflection of high research standards, countless invention proposals have sprung from the campuses of Keio University. Indeed, over

### Keio University IPC Activities



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.

## 1 Industry-Academia Information Exchange

To stimulate industry-academia collaboration through IP/technology transfer even further, Keio University is strengthening information exchange between industry and academia and advancing knowledge fusion.

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

To continuously introduce the world to technology that originates from Keio University, the "Keio Innovation Network" was established in 2004 as a means to strengthen the technology transfer infrastructure and broaden contacts between industry and individuals. The Network held five meetings in 2007. At each gathering, two speakers introduced new technologies. With a number of repeat participants from industry, the Network has steadily built strength.

•Held on April 18

**Development of Biomarkers as Efficacy Indicators for Rejection of Blood and Immunosuppressants**

Yusuke Tanigawara, Professor, School of Medicine

**Simulation of Red Blood Cell Metabolism and Analysis of Patient Movement (Information Revolution in Bio Research: Revealing Life's Secrets through the Computer)**

Yoichi Nakayama, Assistant Professor, Graduate School of Media and Governance

•Held on July 25

**Observation of Ripplon on a Liquid Droplet Adhered to the Tip of an Optical Fiber**

Takahisa Mitsui, Associate Professor, School of Medicine

**Micro 3D Processing through Miniature High-Performance Tilt Sensors**

Yoshinori Matsumoto, Associate Professor, Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology

•Held on November 28

**Ultra Wideband RFID**

Yukitoshi Sanada, Associate Professor, Department of Electronics and Electrical Engineering, Faculty of Science and Technology

**Application of Passive Tags with Batteries in UHF RFID System**

Jin Mitsugi, Associate Professor, Graduate School of Media and Governance

•Held on January 30

**New Pharmaceutical Development for Cardiomegaly, from Physiological Role of Enzyme Dephosphorylation Specificity in Cardiovascular System**

Takeru Zama, Senior Assistant Professor, School of Medicine

**New Chemotherapy against Cancer, Leukemia, and Diabetes**

Kazuo Umezawa, Professor, Department of Applied Chemistry, Faculty of Science and Technology

•Held on March 13

**Light Slot Exchange Network based on Ultra High-Speed Switch**

Yutaka Arakawa, Assistant Professor, Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology

**Toward Parallel Terabit Transmission: a Distributed Refractive-Type Polymer Optical Waveguide for Onboard Interconnections**

Takaaki Ishigure, Senior Assistant Professor, Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology

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

On July 2 and 3 and February 7 and 8, executives from venture companies introduce business strategies and future developments.

### (3) IPC website: <http://www.ipc.keio.ac.jp/english/index.html>

The IPC regularly updates information about new inventions and their inventors. In particular, the website provides an overview of each patent in English.

## 2 Symposiums

### (1) Intellectual Property Center Symposium (3/7, at Mita Campus G-SEC)

**2008 International Symposium on Industry-University-Government Collaboration at Keio University: Looking Ahead to the Next 10 Years**

The symposium featured experts from Keio University and overseas. Dr. Fiona Willis is director of Tech Transfer Invention Licensing at the University of Washington. In 2007, Keio University and the University of Washington concluded a cooperation agreement. Dr. David Baghurst belongs to ISIS Innovation Ltd., the technology transfer company of the University of Oxford (UK). Ms. Dana Bostrom is the director of the Innovation & Industry Alliance at Portland State University and former Vice President of AUTM. Mr. Hiroshi Ishikawa is the general manager of the Intellectual Property Department, Business Development Division, Mochida Pharmaceutical Co., Ltd.

### (2) "University-Industry Collaboration Forum" by Kanto-Kansai 10 private universities (12/13, Kwansai Gakuin Hall)

This Forum is jointly held by Keio and nine other private universities. They are Chuo University, Tokyo Denki University, Nihon University, Meiji University, Waseda University, Kansai University, Kwansai Gakuin University, Doshisha University, and Ritsumeikan University. The theme of the fourth Forum was "Innovation and Inter-University Collaboration."

Keynote Speech: Innovation Creation and the Role of Various Players (Individual, University, Business, and Government) in LCD display Development

Mr. Fumiaki Funada, Chief Engineer, Display Technology Development Group, Sharp Corporation

Each university also gave presentations on the sowing of research seeds.

## 3 Intellectual Property Center Award/Education

### (1) Intellectual Property Center Award

The annual Intellectual Property Center Award was established in 2000 to spread the word of center activities throughout Keio University and to communicate new initiatives to society. The eighth award in 2007 was given to Professor Kenichi Shimizu (Faculty of Economics) and Deputy Manager Tomoaki Mitani (Center Service Facilities for Science and Technology Research) for technology leading to the development of an ultra high-speed SEM specimen preprocessing apparatus.

### (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 a course entitled "Topics in Intellectual Ownership."

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

i) To learn about overseas laws and contracts, the IPC uses three training courses sponsored by the Association of University Technology Managers (AUTM). These training experiences are fed back to other departments so that their benefits may have a wide influence.

ii) To improve the level of expertise in international patent applications and contracts, the IPC sponsored three seminars featuring Japanese lawyers who are active in patent and contract law overseas. The seminars were held on July 23, December 3, and February 1.

iii) To improve search skills in overseas patents, the IPC sponsored a patent information search seminar on September 27 featuring an examiner from the Patent Office.

iv) On March 27, the IPC sponsored a seminar on technology transfer efforts in the United States. The seminar featured the director of Kanazawa University Technology Licensing Organization.



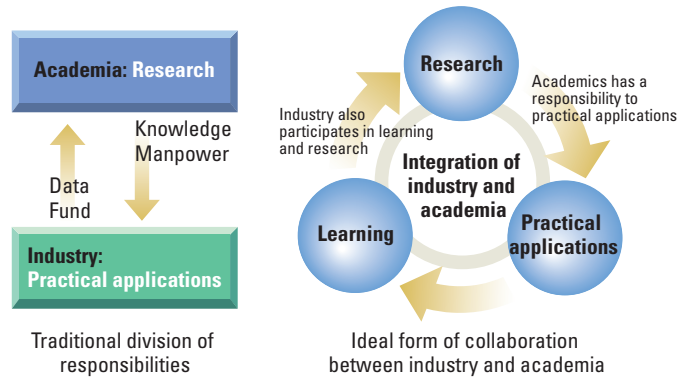
# Incubation Center

## Fostering People with "Entrepreneurship"

The Keio Incubation Center (KIC) was established in October 2003 under the Organization for Research Advancement and Administration (ORAA) as part of measures for the execution of "New Business Leadership," which were outlined in the Keio University 21st Century Grand Design. "New Business Leadership" includes Keio University's mission to "Contribute to Japan's growth and to the creation of new business in the 21st Century by providing practical training, such as new business education and entrepreneur education, and by starting venture business and other new business fields.

Since its establishment, Keio University has been giving back knowledge to the community through research and education activities.

"Giving back knowledge to the community" is at the heart of university activities aimed at fostering people with entrepreneurship and the process of creating new business by sublimating the results generated by universities into sustainable frameworks in the form of business (the process of "Incubation"). These activities should therefore be undertaken as an integrated part of research and education activities, rather than being separated from them.



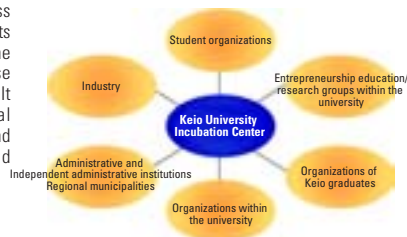
The way in which a university gives back knowledge to the community should not be limited to the traditional approaches of "Providing knowledge and manpower." Universities must promote incubation based on a stance of "Collaborating with industry from the stage of education and research, and taking responsibility even up to the practical application of the results."

Based on these policies regarding the creation of new business, the KIC and the each campus works in collaboration with industry from the education and research stage through to the point where the results are returned to the community, with the goal of promoting the creation of new business and the creation of economic and social value.

### 1 Activity Policies

- The KIC develops frameworks for the continuous creation of new business, targeting support for the creation of new businesses that are expected to gain financial independence in the future. This continuous cycle is achieved by having new businesses that have been established, and which have grown with the university's support, and provide training and support for subsequent new businesses.
- The large number of Keio graduates in the industrial world, and the strength of their centripetal force, is an absolute strength of Keio University. The KIC collaborates with the Mentor Mita-kai and other organizations to promote new business creation activities through the combined efforts of students, teachers and administrators, and graduates. It also strives to create an open community that includes cooperating organizations not related to Keio graduates.

Promotion Structure of Incubation Activity



- In the context of new business creation activities, the KIC respects and supports the initiative of the individual campuses and diverse organizations and activity groups. It also strives to form mutual collaborations among groups and organizations both inside and outside Keio University.

### 2 Planning and studying of systems and frameworks (Financial support schemes, etc.) required for venture support

**(1) Collaboration with SBI Holdings, Inc.**  
The KIC has begun collaborations with SBI Holdings, Inc. through SOI Asia (School on the Internet Asia), which is operated by Keio University, with the goal of fostering Asian entrepreneurial spirit and supporting venture companies originating from universities. (Refer to "Topics" (P.13) for details)

**(2) Handling of equity obtained through the results of incubation**  
In 2007, the KIC entered into a new equity contract in which technical know-how derived from the results of research at the Keio Research Institute SFC was transferred to a venture company that was originated at Keio University, and in which Stock Subscription Warrants were received as compensation. Using this contract as a test case, the Center investigated the handling of exercising such Subscription Warrants or selling stocks for venture companies obtained as a result of incubation activities at Keio University.

### 3 Surveys and statistics related to incubation activities and venture companies originating from universities

At the end of the 2007 academic year, there were 59 venture companies originating from Keio University (16 of these venture companies were established based on intellectual property).

### 4 Support for incubation activities, and organization of networks

**(1) Incubation Seminars**  
In other countries, "Limited Liability Partnerships (LLP)" and "Limited Liability Companies (LLC)" have been established as a new business structure to promote the creation of business, and have

demonstrated outstanding results in the promotion of industry. Within Japan as well, the standards for the implementation of the LLP Law and the LLC law were amended on March 1, 2006, resulting in increased expectations for the use of LLPs and LLCs in the creation of new business by venture companies and through industry/academia collaborations. On January 25, 2008, the KIC hosted an "Incubation Seminar" for both teachers and students entitled "Mechanisms and establishment of LLP and LLC." There were three invited lecturers at this seminar: Mr.Toru Uchida, Assistant Director of the Industrial Organization Division, Economic and Industrial Policy Bureau, Ministry of Economy, Trade and Industry; Mr.Sadakazu Hashimoto, Chief in the same Industrial Organization Division; and Mr.Hirokazu Igarashi, President of Five Consulting Ltd.

**(2) KEIO INCU-NET gathering**  
On January 25, 2008, the KIC hosted "KEIO INCU-NET," a gathering of members from inside and outside the university closely involved in incubation activities, to report on the Center's activities and exchange opinions on activity plans.

### 5 Support for the operation of Incubation Facilities

"Keio Fujisawa Innovation Village," a core facility of the "Keio University Collaborative Entrepreneur Development Program", put out its sixth call for new tenants starting on October 22, 2007, and the new tenants have been decided. "Keio Fujisawa Innovation Village" is turning out new venture companies one after another.

Number of tenant venture companies		As of March 31, 2007
	Number of organizations	Notes
Number of tenants	28	(breakdown) 14 organizations: University-related 13 organizations: Local venture company tenants 1 organization: Student entrepreneur projects
Number of tenants incorporated after moving into the facility	3	



Keio Fujisawa Innovation Village

### 6 Support for the operation of business plan contests, etc.

**(1) Support for the 2nd Keio Business Plan Contest**  
The KIC provided support for the Keio Business Contest (KBC) held by a Keio University student organization in 2007. At the final meeting of judges for The 2nd Keio Business Plan Contest, held on March 8, 2008, six finalist teams that made it through the first and second screenings out of many entries presented business plans to five judges. Once plan was selected as the Most Outstanding Plan, two were selected as Outstanding Plans, and one received a Special Award.

**(2) Fostering Environmental Business through industry/academia collaborations with Sumitomo Mitsui Banking Corp.**  
On September 6, 2007, the KIC reached an agreement with Sumitomo Mitsui Banking Corp. (SMBC) regarding operations aimed at fostering environmental business. Through these collaborative operations, SMBC hosted "Eco Japan Cup 2007," an environmental business contest, in cooperation with the Japanese Ministry of the Environment and Environment Business Women (HERB). As part of the plan for calls for entries in this contest, if improvements to business plans (e.g., resolution of technical issues or increased utility) are expected through joint research with the university, then an "SMBC Eco - Business Scholarship" will be offered to cover joint research expenses. In 2007, a research grant of five million yen was provided for joint research between Keio University and Annex Corp., which won the SMBC Award" in "Eco Japan Cup 2007."

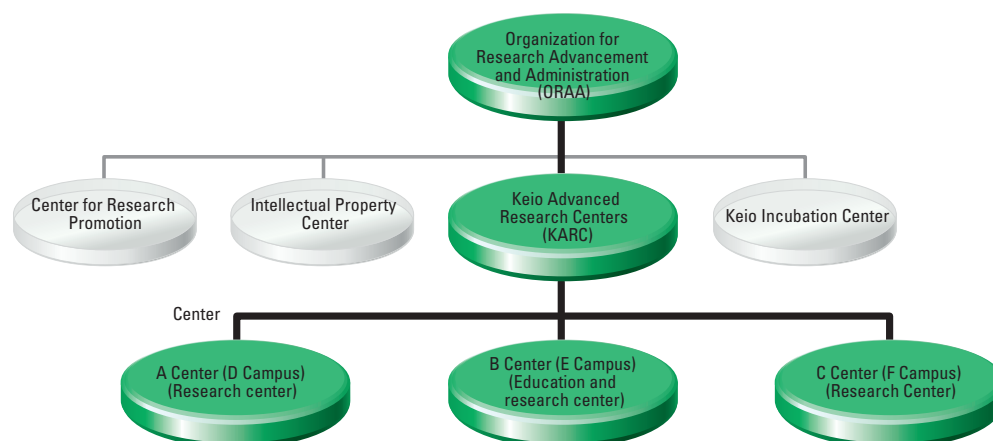
# Keio Advanced Research Centers (KARC)

## Supporting advanced, interdisciplinary research activities

### What is KARC?

In recent years, Keio University has received an increasing number of requests to form new types of research centers (or education and research centers) that merge and connect a wide range of research fields. In response to these requests, the Keio Advanced Research Centers (KARC) was established on February 1, 2007.

KARC dynamically sets up research centers and operates and manages their personnel to promote advanced, interdisciplinary research independent of the university's institutional structure.



### Unique features of KARC

More than 20 Centers were set up within just one year of KARC's establishment. Two of these Centers have already completed their activities.

KARC has several unique functions.

- It forms advanced, strategic research centers at Keio University.
- It proposes and develops new fusion areas not restrained by frameworks of existing academic disciplines.
- It constructs organizations that are capable of handling dynamic research projects.

One of KARC's functions is streamlining the activities of research centers to enable them to efficiently complete their missions.

KARC has also introduced a unique concept called "Starting Up Center". It is a preparatory center for research groups with clear academic objectives and concrete plans to use in setting up a more formal research center later. In 2007, four centers were set up under this scheme.

### The Aim of KARC

KARC is an interface for a wide range of research centers (or education and research centers) that are representative of Keio University. It operates these centers in a wide range of formats, including Global Centers of Excellence and centers funded by Japanese public funds (such as the Special Coordination Fund for the Promotion of Science and Technology), as well as EU Centers of Excellence and centers undertaking joint research with private corporations. Campuses hosting such research centers can be found on virtually all of Keio University's campuses: Mita, Hiyoshi, Yagami, Shinanomachi, Shonan Fujisawa, and Shin-Kawasaki.

KARC itself is an aggregation of research centers crossing over existing disciplines and faculties, conducting advanced research and activities in collaboration with industry, government, and academia. Its aim is to be a truly advanced entity, utilizing the unique characteristics of the centers' respective faculties and campuses and merging those characteristics to create new frameworks for and approaches to carrying out research at Keio University.

### Centers within KARC (as of May 21, 2008)

Center Name	Center Director	Period	Home Campus
Center for Human Metabolomic Systems Biology	Professor, Graduate School of Medicine	Makoto Suematsu 2007/02/01~2012/03/31	Shinanomachi
International Center of High-Level Global Cooperation for Leading-Edge Platform on Access Spaces	Professor, Graduate School of Science and Technology	Kouhei Ohnishi 2007/02/01~2012/03/31	Yagami
Centre for Advanced Research on Logic and Sensibility	Professor, Graduate School of Human Relations	Shigeru Watanabe 2007/02/01~2012/03/31	Mita
System Design and Management Research Center	Professor, Graduate School of System Design and Management	Yoshiaki Ohkami 2007/02/01~2009/03/31	Hiyoshi
GSP Center (Center for Genome Super Power)	Associate Professor, School of Medicine	Jun Kudo 2007/06/01~2010/05/31	Shinanomachi
Center for Integrative Mathematical Sciences(CIMS)	Professor, Graduate School of Science and Technology	Yoshiaki Maeda 2007/05/01~2011/03/31	Yagami
The Center for Civil Society with Comparative Perspective (CCC)	Professor, Graduate School of Law	Yoshiaki Kobayashi 2007/04/01~2012/03/31	Mita
Co-Mobility Society Research Center	Professor, Faculty of Science and Technology	Hironao Kawashima 2007/07/01~2010/03/31	Shin-Kawasaki
Market Quality Research Center at Keio University	Professor, Faculty of Economics	Eiji Hosoda 2007/09/01~2012/03/31	Mita
Panel Data Research Center at Keio University	Professor, Faculty of Business and Commerce	Yoshio Higuchi 2007/09/01~2012/03/31	Mita
Education and Research Center for Stem Cell Medicine	Professor, School of Medicine	Hideyuki Okano 2008/01/01~2012/12/31	Shinanomachi
Keio Jean Monnet COE Centre for EU Studies	Professor, Faculty of Law	Toshiro Tanaka 2007/09/01~2012/08/31	Mita
Center for High Trust Global Network Society	Professor, Faculty of Policy Management	Jiro Kokuryo 2007/11/15~2009/11/14	Shonan Fujisawa
Center for Meso - Governance	Professor, Graduate School of Media and Governance	Yasunori Sone 2007/11/20~2009/11/19	Shonan Fujisawa
Media Design Research Center	Professor, Graduate School of Media Design	Masahiko Inakage 2008/02/01~2013/01/31	Hiyoshi
Work - Life Balance Research Center	Professor, Faculty of Nursing and Medical Care	Kaeko Yamashita 2008/02/01~2010/01/31	Shonan Fujisawa
Research Center for Life - Conjugated Chemistry	Professor, Faculty of Science and Technology	Haruma Kawaguchi 2008/03/01~2011/03/31	Yagami
Center of Governance for Civil Society	Professor, Faculty of Law	Yoshihisa Hagiwara 2008/03/01~2010/02/28	Mita



## Faculty of Pharmacy / Graduate School of Pharmaceutical Sciences

Established in April 2008 as a new base of research to lead the future of pharmaceutical science

The Faculty of Pharmacy and the Graduate School of Pharmaceutical Sciences were newly established at Keio University in April 2008, through a merger with Kyoritsu University of Pharmacy. Even after the merger, the equipment and facilities at the Shiba-Kyoritsu Campus (Minato Ward, Shiba Koen) are still used as in the past. Since its establishment nearly 80 years ago, in 1930, Kyoritsu University of Pharmacy has turned out roughly 13,000 pharmacists and pharmaceutical researchers. By carrying on this outstanding track record and combining the comprehensive capabilities of Keio University, this new Faculty and Graduate School will strive to lead and to achieve new developments in the field of pharmaceutical sciences, throughout the stages of education, research, and social contributions.

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

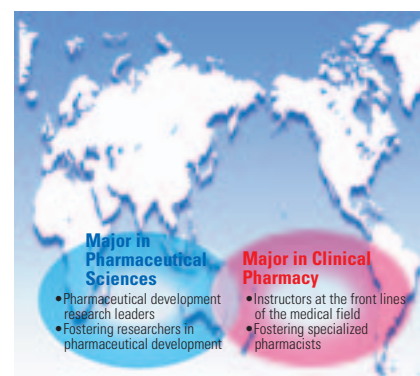
### Unique Features of Education

A new six-year program of education in pharmaceutical science began in the 2006 academic year, and research in this field is expected to make substantial contributions not only to high-quality medicine, but to society as a whole. The Keio University Graduate School of Pharmaceutical Sciences has taken over the responsibility for education and research conducted in the past by Kyoritsu University of Pharmacy, but at the same time it has clearly laid out the following goals in terms of fostering manpower in this field.

The goal of the Major in Pharmaceutical Sciences is to undertake research characterized by high-level education, creativity, and flexibility through advanced education and research in pharmaceutical sciences, including pharmaceutical development, life sciences, and pharmacology, in order to foster pharmaceutical researchers with a high level of specialization and global knowledge.

The goal of the Major in Clinical Pharmacy is to foster professional clinical pharmacists equipped with the research abilities and clinical skills required to work in the medical field, including drug treatments and individual drug treatment methods; filling prescriptions and providing

guidance on dosages; pharmaceutical information; pharmacokinetics; and drug administration plans. In all majors, the goal is to construct "graduate school education that is attractive to the international community," with a view toward fostering manpower that can contribute to activities on a global scale.



### Structures and past achievements in joint research

In the Graduate School of Pharmaceutical Sciences, a total of about 20 divisions in the two majors undertake individual research, while projects that undertake research with participation from multiple courses have been selected as "Science and Technology Advancement Operations" by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Specific examples of activities include: "Development of treatment drugs for intractable ailments targeted by signal molecules, and analysis of interactions between drugs and signal molecules in cells" (High-tech Research Center Operations); "Development of new treatment methods for intractable ailments based on clarification of molecular structures in the stress responses of living organisms" (Scientific Frontier Operations); and "Reduction of side-effects and development of efficient pharmaceuticals through the analysis of factors that affect pharmacokinetics" (Open Research Center Operations). All of these projects involve research that forms the bases for the creation of new drugs and research as applied to medicine, and are designed to achieve the successful development of treatment drugs for intractable ailments targeted by signal molecules, and analysis of interactions between treatment drugs for intractable ailments such as cancer and intractable nerve disorders.

#### High-tech Research

(2004-2008)

Participating divisions: 12

#### Scientific Frontier

(2006-2010)

Participating divisions: 7

#### Open Research

(2007-2011) (participation)

Participating divisions: 8

### Notable research

The Graduate School of Pharmaceutical Sciences is currently conducting intensive research activities in the following research fields:

- Analysis of cytokine signals and development of functional drugs (Division of Biochemistry)
- Research on the mechanism of anticancer drug resistance (Division of Chemotherapy)
- Development of fullerene derivatives with anti-HCV and anti-HIV activities (Division of Medicinal Chemistry)
- Development of cholinergic neuron activation drugs that target the high-affinity choline transporters (Division of Pharmacology)
- Research on molecular mechanism in drug delivery system (Division of Pharmaceutics)
- Design and development of drug delivery system utilizing functional polymer.(Division of Physical Pharmaceutical Chemistry)

### Contract research themes

With the merger, the Graduate School of Pharmaceutical Sciences is seeking out new developments and pursuing potential in areas such as international joint research and collaborations between industry, academia, and government. (Source: Contracted research themes: Achievements over the past three years)

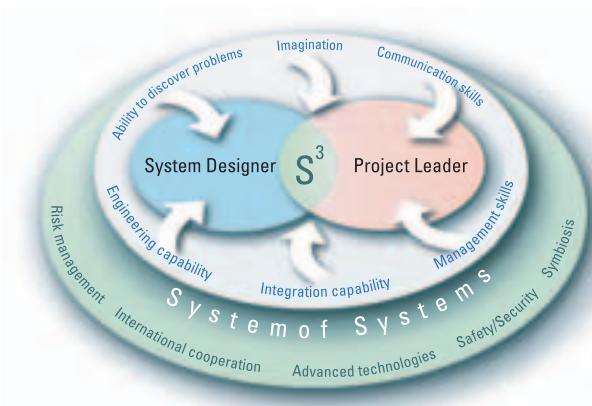
- Pharmaceutical tests for preparing clinical trial (Phase III) of Famciclovir for Herpes Zoster"
- Effects of prostaglandin D2 receptors (DP) on lymph cell cholinergic system: research on the effect of acetylcholine production during antigen-presentation reaction
- Evaluation of newly developed HPLC columns and its application for real samples
- Effects of antioxidative fullerene derivatives on inflammation and physiological response
- Establishment of novel administration method of new and known compounds

#### Shiba-Kyoritsu Campus

Administration Section; Research Support  
1-5-30 Shiba Koen; Minato-ku, Tokyo 105-8512  
TEL: +81-3-5400-2653  
E-mail: [skc-shien@adst.keio.ac.jp](mailto:skc-shien@adst.keio.ac.jp)

## Graduate School of System Design and Management (SDM)

The Graduate School of System Design Management fosters future leaders for a new generation



S<sup>3</sup>=Symbiosis, Safety and Security

Nowadays the society is in a transition state to a multi-polar society, with many elements, such as races, languages, culture, and economic blocs. At the same time, problems related to energy, food, and the environment are growing increasingly serious, and we must keep being aware of these problems in the human activities.

It has become important to see society as a large system in which all elements are becoming increasingly complex from the products and services to social infrastructures. In order to maintain this advanced and increasingly complex system, there is a strong demand for people with the ability to deal appropriately with such systems among various fields in society. The goal of the Graduate School of System Design and Management is to foster specialists capable of dealing with complex systems by freely utilizing methods and approaches. Following are the unique features of education at the Graduate School of System Design and Management.

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

### Unique Features of Education

First, the people that the Graduate School of System Design and Management aims to foster are those who have the ability to deal with a wide range of complex systems ("System of Systems") as illustrated in the figure above, and to lead in realizing a sustainable society that is symbiotic, safe and secure. Specifically, in addition to creativity, communication skills, and the ability to discover problems, an emphasis is placed on providing Systems Designers with engineering skills, and providing Project Leaders with management skills.

The second unique characteristic of this Graduate School is a kind of "melting pot" gathering people with diverse backgrounds and perspectives. This does not simply mean a merging of technical and non-technical approaches, but also a merging of generations and between governmental and industrial worlds. In this way, the School will develop the ideal forms of leadership and facilitation in the real world.

The third unique characteristic is a program to produce human resources with the ability to collaborate on a global scale. In addition to providing a wide range of courses required to cultivate an international perspective, such as law, economics, business intelligence, and environmental issues, the School will actively promote strong ties with overseas universities. For example, though a practical design project conducted over one year in collaboration with the MIT Engineering Systems Division and the Department of Mechanical Engineering of Stanford University, the students learn teamwork and solidify their design management skills. This design project, referred to as the "Active Learning Program Sequence (ALPS)," involves group research that focuses mainly on independent activities by students.

### Research on themes that emphasize the front lines

Research activities related to the system design and management are based on strong ties with many companies and organizations promoting research themes targeting the needs of real world on the front lines of business. Included are such as organizations as Japan Aerospace Exploration Agency (JAXA), Tokyo Gas, SUMCO, Railway Technical Research Institute, Nikkei Inc.

It is noted that the Global COE Program entitled "Center for Education and Research of Symbiotic, Safe and Secure System Design" has been approved and funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). A new center started in 2008 in cooperation with the Graduate School of Science and Technology. This will further enhance collaborations with overseas universities providing Ph.D. students with opportunities for international interactions.

### Manpower development

After completion of the program at the Graduate School of System Design and Management, students are expected to become powerful leaders in promoting development projects and product innovations in an era of globalization.

# Graduate School of Media Design (KMD)

## A Creative Society Led by Creative Innovators

### The Four Forces Driving a Creative Society



The Graduate School of Media Design (KMD) was established in April 2008 to advance integrated research and education in the fields of digital media, content, and design. With a focus on creativity, KMD is an advanced interdisciplinary education program for the development of "media innovators" who can become leaders on the international stage. Until July 2008, KMD activities were based at the Mita Campus. From August, KMD has established a home at the Hiyoshi Campus.

Under the guidance of 13 faculty members, research and education at Keio Media Design focuses on creative design, technology, management, and policy.

For the initial application period, KMD is accepting 80 people into the master's program and 10 people into the doctoral program.

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

### Education System

Making a fresh departure from a majority of past research systems in Japan, KMD establishes a new education platform with five main functions.



#### 1. World-Leading Research and Education Organization

We practice creativity-driven education and research activities that generate new knowledge and modes of expression. These efforts are converted into new values that become the driving force in an innovative digital society. Promoting interaction between diverse fields fosters individual creativity and moulds our future society.

#### 2. Three in One Framework

Based on a research (project) centric education program, we have a 3-in-1 framework of research, education, and transmission to society.

#### 3. Multi-Satellite Global Network

To respond to advanced themes and to achieve a dynamic structure, we have a multi-satellite network, with headquarters at the Keio Hiyoshi Campus, based on collaboration with organizations in Japan and overseas.

#### 4. Research Centric Education

We practice creative research based on imagination, flexibility, and openness. Our aim is to develop media innovators who can lead the way in the 21st century through their research efforts.

#### 5. New Governance Enabling International Human Resource Development

Our approach to governance as an education and research organization is to always respect individual conditions while developing media innovators who have broad expertise and an international perspective.

### Real Projects

"Real projects" grapple head-on with specific social themes in the field of media design. They combine the fields of design, technology, management, and policy in practical research collaboration between industry, government, and academia.

Students work together with faculty to advance research based on five essential project skills: fieldwork, strategic planning, concept thinking, prototyping, practicing, and testbedding. Each student is required to give full play to his/her originality within a given research role. The column on the right describes the real projects currently envisioned.

[http://www.kmd.keio.ac.jp/jp/curriculum/real\\_project.html](http://www.kmd.keio.ac.jp/jp/curriculum/real_project.html)

#### Cross Media

The Cross Media project seeks to move beyond convergence to forge dynamic change. Important themes include developing global Internet ventures, strengthening information communication; making use of technological advances in production; and advancing interactive collaboration between traditional media, new media, content producers, and advertising. Through testbedding, this project aims for the dynamic development of media that will lead to a creative society based on imagination as the source of value.

#### Content Strategies

Content is the essence of a creative society and a strategic asset in the 21st century. The question is how to establish a mechanism to produce, distribute, and use different types of digital intellectual property. What is the best way to digitally produce the popular culture in which Japan excels (e.g. anime, software games, mobile phones) and traditional culture? The Content Strategies project aims to explore emerging content, to develop funding schemes and transaction markets, to revise copyright rules and business platforms, and to prepare a new soft power policy.

#### Experience Design

To give priority to the imagination of people in a creative society, we must re-design the environment and artifacts of daily life. The Experience Design project aims to design environments and artifacts for physical and virtual settings such as homes, schools, hospitals, public areas, and office spaces. The project establishes experiential design methods, develops and tests physically interactive technologies, and constructs business models.

#### Global Computing

In hot pursuit of the global information society, our Earth is becoming increasingly interwoven with the Internet and other types of digital communication infrastructure. Giving full play to the most advanced digital technologies, the aim of the Global Computing project is to design and manage the activity environment of global citizens and the global information society.

# Expanding Horizons of International Research

## Cooperation Agreement with SBI Holdings on Support for Ventures Originating from Asian Universities



Online MOU\* Signing Ceremony with SBI Holdings  
From left to right, Vice President Jun Murai of Keio University, Representative Director and CEO Yoshitaka Kitao of SBI Holdings, and Director Jiro Kokuryo of Keio Incubation Center  
\* MOU: Memorandum of Understanding

On November 22, 2007, Keio University and SBI Holdings signed an MOU\* to support venture business originating from Asian universities.

Based on seamless cooperation between industry and academia, the purpose of the MOU is to develop the entrepreneurial spirit of young Asians and to support venture business originating from Asian universities. The agreement sets up a collaborative partnership between SBI Holdings, the Keio University Incubation Center, and the School on Internet Asia (SOI Asia). SOI Asia is an international education project run by Keio in cooperation with 27 universities and research institutes in 13 regions.

Through the activities of SOA Asia, SBI Holdings plans to provide early funding of venture business originating from faculty, researchers, students, and graduates who belong to universities and research institutes in the Asian region collaborating on education and research.

Keio University is examining the possibility of establishing an SOI Asia Business Social Platform as a limited liability partnership (LLP). This would be a new form of industry-academia collaboration with the aim of contributing to the establishment of business based on entrepreneurs and technology achievements in the Asian region and of returning the benefits of research back to society on a broad scale.

## Launch of Collaborative Bio-Mining Research with BioSigma S.A. (Republic of Chile)

The Institute of Advanced Biosciences, Keio University (IAB) and BioSigma S.A. (joint venture between CODELCO (Chilean State owned copper mining company) and Nippon Mining & Metals Co.) have started joint research on bio-mining (mining technology using micro-organisms). This research will be carried out in a new research laboratory established by BioSigma S.A. inside the Tsuruoka City Advanced Research Industrial Support Center (Tsuruoka Metabolome Campus), where a signing ceremony was held on January 16, 2008. The ceremony was attended by the General Manager of BioSigma S.A., the President of Nippon Mining & Metals Co., Ltd., and the Ambassador of Chile to Japan.



Collaborative Bio-Mining Research Agreement

The IAB is attracting international attention for pioneering work in the new life science field of "systems biology," which harnesses both cutting-edge biotechnology and information technology. The IAB-BioSigma collaboration is expected to lead to the development of innovative technologies to extract metals from ores—at low cost and low energy consumption, using microorganisms.

## Column

### Becoming a World Leading Research Group

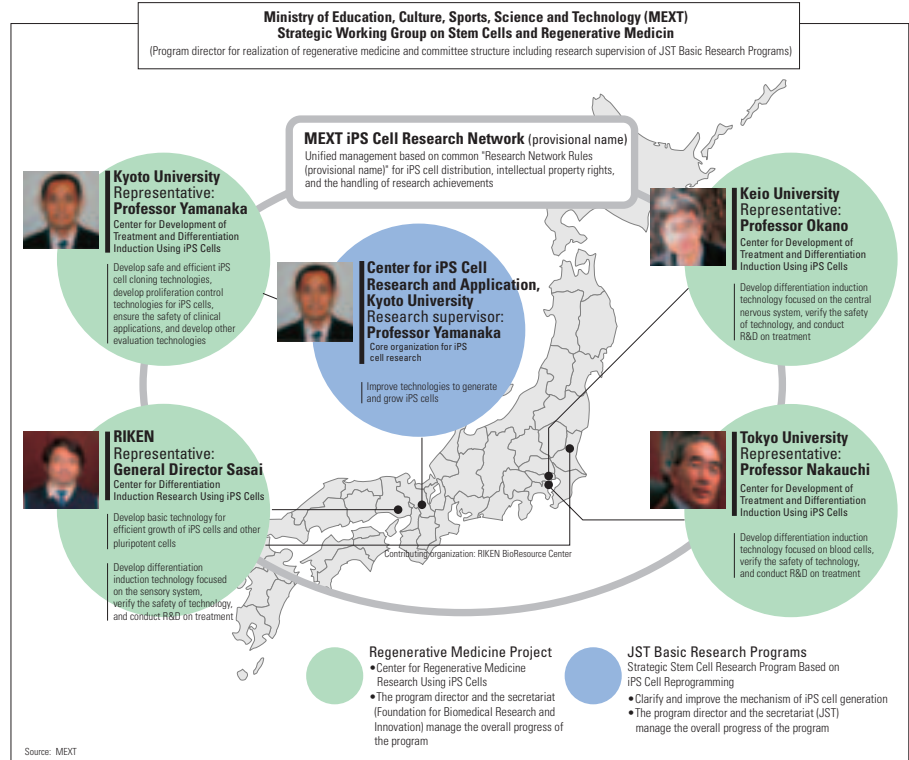
Professor Hideyuki Okano, School of Medicine, Selected to Head MEXT Research Center for iPS Cells

On February 29, 2008, Keio University (research representative: Professor Hideyuki Okano, School of Medicine) was selected as a research center for human induced pluripotent stem (iPS) cells under the project for realization of regenerative medicine by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). This project is expected to lead to applications in regenerative medicine. Kyoto University, Tokyo University, and RIKEN have also been selected as research centers for iPS cells.

Professor Okano heads the "Research Center for Development of Treatment and Differentiation Induction Using iPS Cells." The aim of the center is to develop differentiation induction technology focused on the central nervous system, verify the safety of technology, and conduct R&D on medical treatments. Induced pluripotent stem cell research is a highly competitive field pitting the Japanese research group in a fierce competition against institutions such as MIT and Harvard. To support the efforts of the Japanese group, MEXT announced a comprehensive strategy to accelerate iPS cell research in December 2007.

The research efforts of the Japanese group have already had successes, such as the cloning of non-neo plastic type of iPS stems (Nikkei Sangyo Shimbun, June 2, 2008). Professor Okano says that he wants play an integral role in an all-Japan effort in iPS cell research and to actualize a world-renowned research group.

### Overview of iPS Cell Research Supported by MEXT in Japan



## Partnership with Luxembourg Income Study (LIS)

Japan's First Panel Data Covering Men and Women of All Ages  
Worldwide Release of Keio Household Panel Survey

At Keio University, the Graduate School of Economics and the Graduate School of Business and Commerce have been working closely since 2003 on a joint research program entitled "Development of a Theory of Market Quality and an Empirical Analysis Using Panel Data," a 21st Century COE Program.

Keio University Design Analysis Center (Director: Professor Yoshio Higuchi, Faculty of Business and Commerce), which was set up as a part of this project, has implemented the Keio Household Panel Survey (KHPS) since January 2004.

This is the first household panel survey in Japan to reflect the demographic composition of the entire country, not merely a particular age or gender group.

In a partnership with the Luxembourg Income Study (LIS), the world's pioneer in research on income inequality with data on over 160 survey items from more than 30 countries, Keio University will be the first in Japan to provide national household panel data to the LIS. This will enable researchers around the world to use KHPS data in international comparisons of income and poverty, which is expected to result in a higher analysis standard of positive economics.

## Main International Research Activities in Fiscal 2007

### The Medtronic Foundation (USA) Grant

A grant from the Medtronic Foundation to develop a clinical research education program in collaboration with the University of Minnesota Academic Health Center

### Oxford International Review (MS), Ltd.

A research grant for information and communication technology and global security

### HUAWEI TECHNOLOGIES CO., LTD.

Commissioned research related to IPTV solutions for wireless networks  
"acquiring innovative solutions of deploying mobile IPTV service over mobile network"

### National University of Singapore

Memorandum of Understanding for joint research in the field of interactive digital media, industry-government-academia collaboration, human resource development and exchange, and international exchange  
("MEMORANDUM OF UNDERSTANDING between NATIONAL UNIVERSITY OF SINGAPORE and KEIO UNIVERSITY")

## International activities and efforts related to intellectual property and incubation

### English website: <http://www.ipc.keio.ac.jp/english/inventions/index.html>

English website was launched in December 2007 to introduce the technology information protected by patents and research efforts of Keio University. The site publishes information about the technology information protected by patents and patent-related abstracts. There is also information about large externally-funded projects, press releases, events, and the reception of awards.

### Keio University Selected for MEXT University Intellectual Property Headquarters Development Project (Promotion of International Industry-Academia-Government Collaboration)

The University Intellectual Property Headquarters Development Project was started in 2003. In 2007, the project was expanded to strengthen its international function. Out of 33 applicants, only 12 organizations were selected. Keio University received 62 million yen for the headquarters development project. The initial amount received in 2003 for IP project expenses was 60 million yen. This brings the total amount received to 122 million yen.

### MOU with Overseas Organizations on exchange of information about Human Resource development, market, licensing in the field of IP.

- Isis Innovation Ltd., Oxford University (Technology Transfer Organization)
- Washington University (Planned)

## Column

### Environment, Safety, and Health 2008

For the sustainable development of society, human activities should preserve the environment and be in harmony with it. Keio University launches various initiatives to directly work on environmental problems. "Environment, Safety, and Health 2008" introduces these efforts and initiatives.

Environment, safety, and health issues are strongly related to campus infrastructure education, research, medical care, and contribution to the local community, and the international community. Going forward, further developments are expected toward the realization of a campus that is highly conscious of the environment, safety, and health.

To commemorate the 150th anniversary in 2008, Keio University is giving full play to its research achievements to promote these activities.

Download the PDF file from here: <http://www.keio.ac.jp/kankyo.pdf>

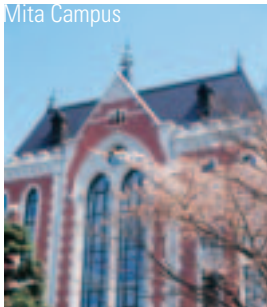


### Keio 150th Anniversary Symposium on the Environment Global Environment Dream Project

In May 2008, the Mita Campus held a symposium on the environmental strengths of Keio University. The symposium was held for high school and university students, introducing them to research efforts related to environmental problems at Keio University. The aim was to inspire young people to participate in environmental activities. The event had over 1,000 participants who listened intently to the words of researchers in various fields involved with environmental problems from Keio University and other organizations. There was also a very stimulating question and answer session in which students and researchers were able to exchange opinions.

For details of the event, check the following website:  
<http://keio150.jp/events/2008/20080511.html>





## Mita Campus/ Hiyoshi Campus

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

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

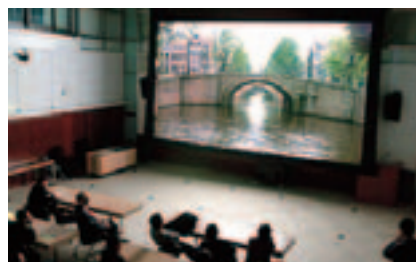
**Hiyoshi Campus**  
4-1-1 Hiyoshi, Kohoku-ku,  
Yokohama-shi,  
Kanagawa, 223-8521 Japan  
TEL: +81-45-563-1111 (Main)



The Mita Campus is home to undergraduate departments (primarily for third- and fourth-year students), 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 three graduate schools. The following is an introduction of research institutions located on these two campuses centering on recent activities, including international collaboration.

#### Research Institute for Digital Media and Content (DMC Institute) <http://www.dmc.keio.ac.jp/en/>

The Research Institute for Digital Media and Content (DMC Institute) seeks to create and circulate knowledge by pursuing research projects that consider digital contents from a variety of perspectives, including content design, media technology, intellectual property management, and industry policy. For overseas centers, we have set up Global Studios in Tsinghua University (China), Yonsei University (South Korea), Cambridge University (U.K.), Stanford University (U.S.), and in New York and San Francisco. In December 2007, the DMC Institute made use of the studios to hold an international symposium entitled "Cooperative and Culturally Global-Scale Computing in the Creative Society," thus demonstrating our commitment to disseminate our achievements internationally. We are also pursuing a next-generational video contents capability, using 4K digital cinema in collaboration with businesses and other universities.



Global Studio

#### Global Security Research Institute (G-SEC) [http://www.gsec.keio.ac.jp/index\\_e.html](http://www.gsec.keio.ac.jp/index_e.html)

The Global Security Research Institute carries out research on the broad field of global security with an emphasis on "watching and warning." In other words, we constantly keep our eyes on problems in various fields and put out necessary warnings. With this consciousness, we participate in industry-government-academia collaborations with an eye toward providing policy advice and creating objective evaluations, while at the same time carrying out our research activities. Our goal is to contribute to the sustained development of society. In FY2007, we expanded and deepened interfaces with society through our research. For communicating common points in the Institute's wide range of research areas, we: 1) started "Watch and Warning" seminars; 2) sponsored the first annual G-SEC conference; and, 3) began publishing the G-SEC Newsletter to strengthen the Institute as a part of Keio University resources.



The 1st Annual G-SEC Conference

The first G-SEC annual conference, entitled "Considering Japan's Country Identity: Japan as a Global Player," held two sessions: "Aiming to Be a Gateway Nation" (keynote speaker: Naoki Inose, vice governor of Tokyo) and "Environmental Security and Japan" (keynote speaker: Ichiro Kamoshita, Minister of the Environment).

Also, in FY2007 each project held symposiums overseas. The "Survey Research on Technologies and R&D for Bioterrorism Preparedness in Japan" project held the first U.S.-Japan Medical Biodefense Research & Bioterrorism Symposium (June 11-14 in Arlington, Virginia, U.S.). The "Academic Frontier, Economic, Energy, and Environmental Security Studies" project held the Conference on Input-Output Analysis for Indian and the World Economy (December 17, New Delhi, India) in partnership with India's Energy and Resources Institute (TERI).

#### Core Research Projects

##### 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.

#### Research Center for the Arts and Arts Administration <http://www.art-c.keio.ac.jp/en/>

The Research Center for the Arts and Arts Administration at Keio University pursues researches in areas including 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. In cooperation with experts, the Center develops and carries out domain-transcending activities such as seminars, lectures, exhibitions, performances, workshops, case studies for art management, construction of art archives, and contract assignments.

In FY2007, the Center held various events: including the concert "Aspects of Jazz 2007— Masahiko Sato and Friends," commemorating the 10th anniversary of the death of the jazz critic Shoichi Yui; the first summer school outside France, jointly held with the Louvre; a workshop inviting the artist Shinrou Ohtake; and, exhibition of the Fuji Xerox print collection, sponsored by the Minato ward.

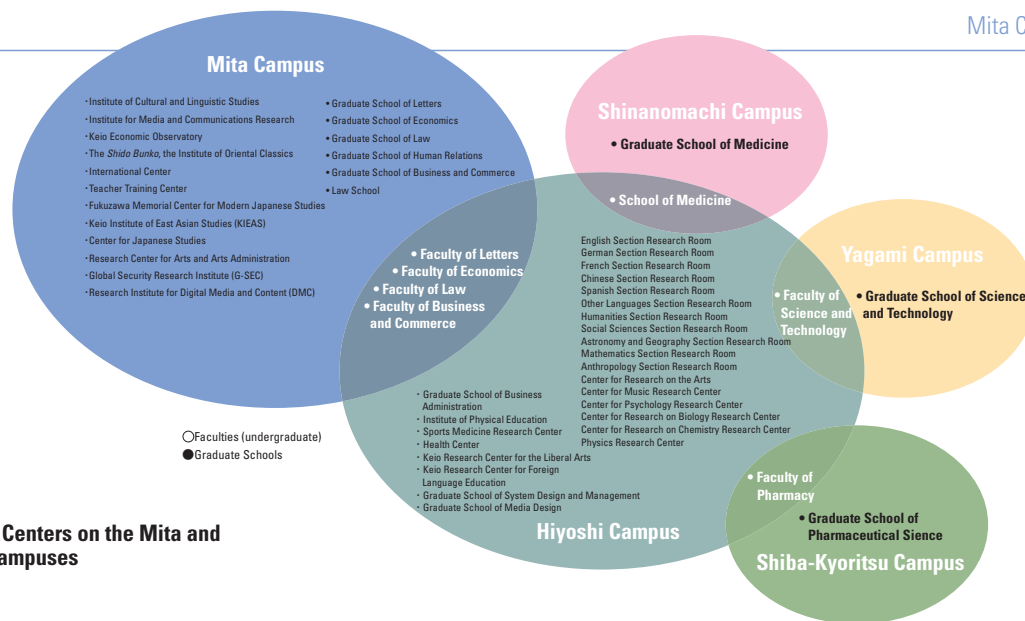
Also, for MEXT's Open Research Center improvement project, "An Integrated Establishment of Digital Archives for the Humanities," the Center is working on the construction of art archives. The Center has established training courses for archivists beginning in FY2007, and furthermore, has established lectures endowed by the Recording Industry Association of Japan.

The Center released its research results to the public in its *ANNUAL REPORT 14* (2006/07) (reporting activities and operation), in newsletters *ARTLET* No. 28 and No. 29, and in special-themed bulletin *BOOKLET* No. 16.



Exhibition commemorating 25th anniversary of death  
"Junzaburo Nishiwaki and the Arts"  
(Dec. 1 - 12, 2007)





## Research Centers on the Mita and Hiyoshi Campuses

### Center for Japanese Studies <http://www.ic.keio.ac.jp/nncenter/>

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, in addition to the education and training of next generation Japanese language teachers.

The Center for Japanese Studies promotes education in Japanese language and culture. It provides Japanese classes for first- and second-year students enrolled at the Hiyoshi campus and international students belonging to the Graduate School of Science and Technology, as well as for 193 international students from 30 countries enrolled in the Japanese Language Program. In addition to Japanese language classes, the Center also runs Japanese language education courses to foster Japanese language instructors.

In the 2007 academic year, the Center published *Nihongo to Nihongo Kyoiku* No. 36 (Japanese and Japanese Language Education, March 31, 2008, ISSN 0286-5742).



Bulletin *Nihongo to Nihongo Kyoiku* (Japanese and Japanese Language Education) No. 36

### The Keio Institute of East Asian Studies (KIEAS) <http://www.kieas.keio.ac.jp/english/index.html>

Since 2006, the Keio Institute of East Asian Studies (KIEAS) has been running a program for East Asian scholars in the U.S. in conjunction with Korea University, Peking University, Fudan University, and National Taiwan University. In FY2007, we welcomed five fellows, and held research meetings and lectures respectively. We also held a joint Japan-Korea symposium and Japan-Korean discussion meetings, and thus furthered studies of the situation in Northwest Asia, and deepened collaboration with Korean researchers. Furthermore, at our symposium with the New Japan-China Friendship Committee for the 21st Century, entitled "Suggestions for Japan-China Relations," committee members from both China and Japan were impressed by the original analyses and opinions offered by students.

In FY2007 the Institute also launched the Center for Contemporary Chinese Studies with support from the National Institutes for the Humanities, giving start to full-fledged research under a five-year plan.



Symposium "Suggestions for Japan-China Relations"

### Fukuzawa Memorial Center for Modern Japanese Studies <http://www.fmc.keio.ac.jp/fmc/eng.html>

The Center has the important task of collecting, organizing, and archiving the historical documents of Keio University and of its founder, Yukichi Fukuzawa. At the same time, it carries out a wide range of research on modern Japan, while keeping its sight on Fukuzawa and the University. The Center returns the fruits of these scholarly activities to the students in Keio and the general public through its courses, lectures, and seminars.

Since its founding, the Center has continued survey of materials related to Fukuzawa and his disciples. It has also instituted courses since FY2005. In FY2007, six courses, including "Modern Japanese Studies I & II," were held on the Mita campus. In the spring semester 2007, the Center invited researchers from China, the U.S. and Vietnam for its lectures and seminars. In the fall, researchers were invited from the U.S., Korea, Vietnam, and France for a symposium entitled "The Autobiography of Yukichi Fukuzawa across the Seas: Considering Fukuzawa Yukichi from Translation."

Also, as part of the commemoration of the University's 150th anniversary, the Center is continuing the editing of the 21-volume collection of historical data on Keio University.

Publication: *Bulletin of Modern Japanese Studies* No. 24 (2007) and *Newsletter of Fukuzawa Memorial Center for Modern Japanese Studies, Keio University* (published twice a year).



Fall semester symposium (November 2007)

### Teacher Training Center <http://www.ttc.keio.ac.jp/>

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 secondary school teachers, and has produced many outstanding teachers since its founding in December 1982.

In the last several years, we have been actively researching assessment of the suitability of teachers for the teaching profession. Based on our project since 2004 on assessing the suitability of student teachers for the teaching profession and our research on curriculum since 2005 with teacher-training courses (offering certificates of completion), 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). This project began operating experimentally in FY2006, and has been operating fully since FY2007. In December 2007, the teacher training report session and public symposium were held to commemorate the 150th anniversary of the founding of Keio University and the 25th anniversary of the founding of the Center. In March 2008, the teacher training report was published. Also, with the cooperation of parties outside the university, the Center has been offering a continual lecture series "Conversations with Society and Third-Parties" and a training forum for nurturing teachers since 2006. 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. 17 and 18 (March 31, 2008).

### International Center <http://www.ic.keio.ac.jp/en/index.html>

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 matters, 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. There are also International Studies and Japanese Studies courses in which both overseas and Japanese students can study subjects such as the culture, history, politics, and economics of Japan and other countries in English, to promote mutual understanding of different cultures.

In addition to this expansion of formal coursework, the 8th Annual Association of Pacific Rim Universities Doctoral Students Conference (APRU DSC) was held from July 20 to August 3, 2007, under the auspices of the Association of Pacific Rim Universities (APRU) as one of the major symposiums that the International Center has supported and held. This international conference enables full-time students of doctoral programs from the universities participating in APRU to present their research and attend debates in a number of different subjects that transcend their own cultural backgrounds and specialist fields. This was the first time it was held in Japan and approximately 100 graduate students from 25 universities in 14 countries participated.

### Shido Bunko, Institute of Oriental Classics <http://www.sido.keio.ac.jp/>

*Shido Bunko* (the Institute of Oriental Classics) is affiliated with Keio University. In addition to the director, the Institute has six academic members and five temporary researchers (four in-house and one visiting). The staff of the Institute examines Japanese and Chinese documents *in situ* in Japan and overseas, copies them, and uses the results for bibliographic research. *Shido Bunko* also maintains a special library that contains approximately 140 thousand books and six thousand reels of microfilm, which can be used by scholars from Japan and overseas. The Institute also provides "*Shido Bunko* Courses" for graduate students, involving lectures and practical exercises designed to help the students acquire bibliographic research skills.

In FY 2007, the Institute welcomed visitors from the Institute of Chinese Classics and Culture, Tamkang University, Taiwan, and held an international symposium on Bibliography co-hosted with related departments of Waseda University and Nishogakusha University. The staff of the Institute have also worked as panelists at international symposia held in China and Japan, and as instructors at international workshops. The Institute also welcomed Mr. Chen Zheng Hong of the Institute of Chinese Classics, Fudan University, Shanghai, China as a visiting professor from the end of this March.

The *Bulletin of the Shido Bunko Institute* No. 42, on February 28, 2007 is in the publications issued during FY 2007.

### Keio Economic Observatory [http://www.sanken.keio.ac.jp/index\\_e.html](http://www.sanken.keio.ac.jp/index_e.html)

The Keio Economic Observatory (KEO) was set up as an affiliated institute in 1959, as part of the commemoration of the 100th anniversary of the founding of Keio University. Since then, it has conducted academic researches in the three fields of Economics, Law, and Behavioral Science. The membership consists of full-time members of the Institute, members from related Faculties, and co-researchers from Japan and overseas. Projects include the construction and analysis of databases on subjects such as input-output analysis, the environment, and Flow of Funds analysis; the oral history of industrial relations; and a proposal for applying the Antitrust Law to public utilities. The Institute is also conducting empirical research into various projects such as an environmental assessment of solar powered satellites (SPS) and an afforestation clean development mechanism (A/R CDM) project. From FY2007, the Institute initiated a project relating to productivity in Asian countries and held an international symposium relating to the measurement of productivity. Publications this year included *the Library of Keio University Sangyo Kenkyujo* and *Keio Economic Observatory Discussion Papers*.

### Institute for Media and Communications Research <http://www.mediacom.keio.ac.jp/english/about.html>

This year, the Institute for Media and Communications Research has five research projects, supported by the Institute's own funds, special donations, and promotional funds. The Institute also participated in the 21st Century COE program "Designing Toward the Ordering of Political Society in a Multi-Cultural and Pluri-Generational World" and members of the Institute hosted the 21COE-CCC International Symposium that was held on the Mita campus from November 23 to 25. The results of the Institute's research have been published in its own Bulletins and a number of books.

Published research included: *Keio Media and Communications Research* No. 58 (March 2008), *Keio Communication Review* No. 30 (March 2008), *The World Picture of TV News: Social Realities Constructed by Foreign-Related News Stories* (Keioshobo December 2007), *News Broadcasts and External Perceptions* (Keio University Press, January 2008, 21COE-CCC Library Dynamic State of Civil Consciousness in a Multicultural World Vol. 43)

### Institute of Cultural and Linguistic Studies <http://www.icl.keio.ac.jp/>

The Institute of Cultural and Linguistic Studies has full-time staff and conducts basic researches on subjects such as the various languages, cultures, and philosophies around the world, and on linguistics and linguistic theory. The Institute promotes a wide range of research projects together with scholars both from within Keio and outside. In FY2007, it issued *REPORT of The Keio Institute of Cultural and Linguistic Studies* No. 39 (March 2008) and *Linguistic Creativity and Diversity in Intellectual History* (March 2008) in FY2007.

The Institute also invites eminent scholars from Japan and overseas to a wide range of international conferences, symposia and lecture meetings, such as the Tokyo Conference on Psycholinguistics (TCP), linguistics colloquia (three times a year), an Islam lecture meeting, and two courses that are open to the public. The TCP report was published as a collection of research papers in English. In addition, the Institute has set up special courses relating to languages that are not offered by any academic department (23 courses on 11 languages).

### The Keio Research Center for the Liberal Arts <http://www.hc.keio.ac.jp/lib-arts/en/index.html>

The Keio Research Center for the Liberal Arts was founded in July 2002 to search for the ideal systems that liberal arts education should adopt through multifaceted investigations and research of the examples in Japan and overseas, planning and offering specific experimental programs, and validating those programs by their outcomes.

The approximately 200 members, from a wide range of educational organizations from integrated high schools to universities and institutes, has been actively conducting research.

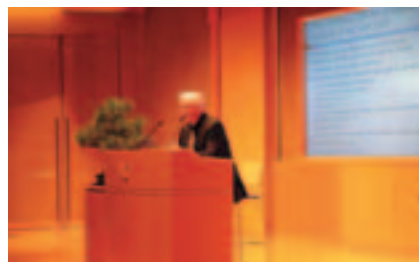
In FY2007, the Center promoted "Core Research" on university education curricula based on the present models of Keio University; "Specialized Research" centered on the "Hyper Digital Research" of the Academic Frontier Program for Promoting Research Excellence at Private Universities; and "Individual Research" that supports the research of the individual member of the Center. The Center is establishing partnerships with research facilities and scholars within and without Keio University to expand research network in liberal arts education. It has also offered experimental courses, lectures, and seminars, together with publishing and validating research results both in printed matter and databases. Periodicals issued by the Center include: *Annual Research Reports*, *Newsletters*, *Symposium Reports*, *CLA Archives*, *Reports*, and *Liberal Arts Research Center Library*.



Participants at APRU DSC (July 30 to August 3, 2007)



Daigoji Kongo Quin Library; Shisho Taizen, published Kan'ei 9 (1633)



Lecture meeting with Professor Walter Erwin Diewert



Some research results



Linguistics colloquium with instructor Howard Lasnik (July 28, 2007)



Open seminar in the Science Cafe (lecture sponsored by Kyokuto Securities: "Life Science Education")

**Keio Research Center for Foreign Language Education** <http://www.flang.keio.ac.jp/>

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. The Center has a total of approximately 100 members covering the range from elementary school to graduate school, and is driving forward with its research activities.

The Center was selected as a center for the Academic Frontier Program for Promoting Research Excellence at Private Universities for its "Action Oriented Plurilingual Language Learning (AOP) Project." This project is expanding research that gains a comprehensive understanding of all study stages from primary school to graduate school and increases the consistency of foreign language study, centered on English-language education, and also focuses on the challenge of enhancing plurilingual and pluricultural capabilities in communications. (<http://www.aop.flang.keio.ac.jp/>)

Periodicals: *Journal of Foreign Language Education*, *Annual Research Report*, and *Keio Research Center for Foreign Language Education Symposium*.



Plurilingual Lounge

**Health Center** <http://www.hcc.keio.ac.jp/>

The field of Health Center's research is divided into physical and mental health. The Center is conducting researches on hypertension, diabetes, metabolic syndrome, obesity and other lifestyle-related diseases, as well as anorexia nervosa, cardiac diseases, liver diseases, infectious diseases, respiratory diseases, and mental disorders.

The Center is collaborating internationally on research into hypertension, strokes, and metabolic syndrome, and has published papers on that research (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, the Center is preparing a paper comparing eating disorders in Japan and the U.S.

The Center published 47 papers written in English between 1972 and 1994, and 188 papers between 1995 and 2007. Members of the Center have also made presentations at international conferences, such as those held by the American Diabetes Association.

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



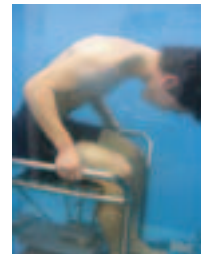
Reception at the Health Center (Hiyoshi)

**Sports Medicine Research Center** <http://www.hc.keio.ac.jp/sports/>

The Sports Medicine Research Center was set up to conduct a wide variety of researches and clinical practices in sports medicine & science, to improve competitive performance of athletes, to prevent injury & accidents in sports, and to promote human health.

In FY2007, the Center held open lectures in partnership with the Graduate School of Health Management on the subjects of "Sports and health: get active for well-being" to present evidence-based information to the community in an easy-to-understand form. The symposium titled "Sports and university; the role of university in sports", was also held in spring. The center also worked with Keio University Athletic League on the 1st Sakura Sports Festival, a joint project with local communities. On the research side, the Center has expanded its activities to focus on links between local communities and universities. Several researches are on going to investigate the relationship between physical activity and lifestyle-related diseases. For example, intervention study related to metabolic syndrome has begun to improve their physical activity and diet. Volunteers from the general public join as the participants. Members of the Center have reported on their research results at local and international conferences.

Publications: *Reports of research during the open courses on Sports and Health in FY2007*.



Measuring body fat by a hydrostatic weighing method

**Institute of Physical Education** <http://www.hc.keio.ac.jp/ipe/>

Since its foundation in 1961, the Institute of Physical Education has promoted the importance of health and sports to Keio University students and teaching staff, and also local residents, through physical education courses within the university, symposiums, and open courses. During that time, the Institute has implemented a wide range of research relating to physical education, health, and sports, and published the *Report on the Research Project 2008 of Institute of Physical Education, Keio University* in March, 2008. This is a compilation of the results of five research projects within the Institute of Physical Education: "Links with Unified Education Schools", "the Management of Industry-University Cooperation on Sport Project", "Research for Improving Techniques", "Evaluation Standards of Anthropometric Measurements and Physical Fitness Levels of Keio University Students", and "Physical Education and Sport: Studies from the Perspective of the Humanities and Social Sciences". From October to November 2007, the Institute also held a total of three open courses on "Sports and Culture: From the Past to the Future", and published the contents of those courses in March 2008.

Periodicals: the *Bulletin Of The Institute Of Physical Education* and *Activity Report of the Institute of Physical Education*.



The Sports Hall, completed in April 2008 (the Institute of Physical Education is inside)

**Hiyoshi Research Portfolio 2007**

On the Hiyoshi campus, where research into a wide range of major fields and areas is promoted, we have made use of the establishment of buildings such as Raiosha to actively expand features such as symposiums, seminars, and public lectures. From FY2005, we intended to pay back to society and form new partnerships by issuing a variety of research achievements both within the University and outside, and we set up the Hiyoshi Research Portfolio (a meeting for displaying and reporting on research results) entitled: "A Place to Interact and Work Together With a Society that Embraces Knowledge". In FY2007, the results of our research were opened to the public over the Internet, as HRP2007. (<http://www.hc.keio.ac.jp/ora/HRP/>)



Raiosha

**Graduate School of Business Administration (KBS)**

From FY2007, the Graduate School of Business Administration has implemented cooperative research activities, popularly known as "the Chair", with France's Ecole Polytechnique. The objective is to investigate a framework that will lead to business success in partnership among corporations from different cultures, which is of importance in today's global business society. The Renault Foundation is providing support by research funding, and research projects between the three countries of France (Ecole Polytechnique, HEC), Japan (KBS), and India (IIM) are currently under way, taking the case of collaboration between Renault and Nissan as an example.

The School also presented "The Reformation of the Business Structure of the Corporations and the Reinforcement of the International Competitiveness" at ESP (Cabinet Office, November 2007), as high-level promotion research, and held a symposium "To Strengthen the International Competitiveness of Japanese Firms" at which specialists in various areas met each other. (<http://www.kbs.keio.ac.jp/>)



Symposium: To Strengthen the International Competitiveness of Japanese Firms



## Yagami Campus

### Aspiring and Working for the Next Frontiers of Science and Technology

**Secretariat of the KLL**  
 (c/o Office of Research Administration, Yagami Campus)  
 TEL: +81-45-566-1794  
 E-mail: [staff@kll.keio.ac.jp](mailto:staff@kll.keio.ac.jp)  
<http://www.kll.keio.ac.jp/>

**KLL Liaison Office**  
 TEL: +81-45-566-1438  
 E-mail: [liaison@educ.cc.keio.ac.jp](mailto:liaison@educ.cc.keio.ac.jp)  
<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 are 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, as members of society who not only study the leading edge, but also open it up for themselves and become leaders of society.

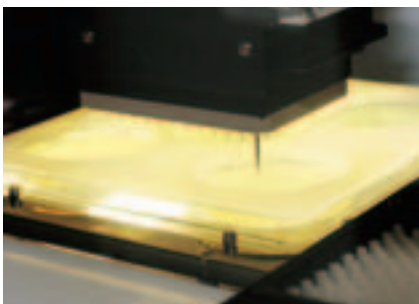
<http://www.st.keio.ac.jp/>



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

The Keio Leading-edge Laboratory of Science and Technology (KLL) was established within the Graduate School of Science and Technology in 2000 as a center for leading academic research and new business creation, and to act as a stage for collaboration between industry, government, and academia. As a point of contact for research partnerships, the KLL promotes dynamic research partnerships that draw on the originality and internationality of Keio University, as well as its strength as a multidiscipline university. To that end, the KLL coordinates joint research and commissioned research projects and also provides detailed support relating to research agreements, and provides a forum for networking with the industrial world in order to promote the return of research achievements to society.

The KLL also has an important mission and is positioned to create new research fields and foster outstanding scholars, and so it works to encourage nascent research and bearers of the future. By providing KLL Specified Research Projects intended for young or newly-appointed scholars and research grant programs intended for doctoral program students, the KLL provides a system of support from both the research funding and environmental viewpoints that is both proactive and carefully planned.

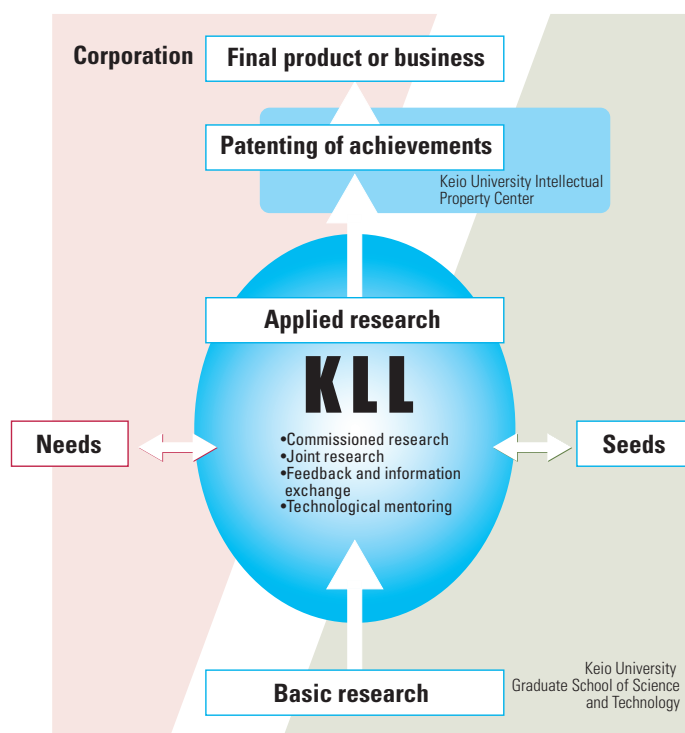


### Research Coordination (Liaison Function)

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 nascent, stage.

By introducing the research activities of the Yagami Campus from various viewpoints and responding flexibly to individual concerns, the KLL creates an interactive flow between corporations and university research activities. Utilization of these dynamics enables the KLL to coordinate optimal joint and commissioned research projects, whether within Japan or internationally.

#### Features of Corporate/University Partnerships under KLL



## To Play a Leading Role in Society

### Fostering of nascent research and researchers

Every year, the KLL calls for "KLL Specified Research Projects" with the objective of focusing on the development of nascent research fields that are considered to be important to society in the future, to create new research fields and encourage the fostering of leaders in those fields.

The KLL also provides research assistance to doctoral program students, with the objective of fostering outstanding scholars in the fields of science and technology. In FY2007, the KLL extended grants of ¥300,000 to each of 130 students in doctoral programs. It has also set up a system to assist with partial travel expenses to students in master's programs, to enable them to present their research at international academic conferences.

### KLL Specified Research Projects Selected in FY2007

(titles below are as given at the time of selection)

#### "Development of Rehabilitation for Restoring Lost Sensorimotor Functions Using Brain-Computer Interface"

Junichi Ushiba, Assistant Professor, School of Fundamental Science and Technology

#### "Implementation of Circuit and System for Flexible Intelligent Wireless Communication LSI"

Hiroki Ishikuro, Assistant Professor, School of Integrated Design Engineering

#### "Optimal Design on of Thermo-Fluids Systems by Using Stochastic Optimization Methods "

Koji Fukagata, Assistant Professor, School of Science for Open and Environmental Systems

## Promotion of Joint Industry, Government, and Academia Projects

The KLL provides support relating to research contracts for research topics that have been matched through actions such as our liaison activities. It considers that the provision of contracts facilitates the pursuit of research in an environment that is advantageous to both sponsor companies and researchers alike. The KLL hopes to provide a total service relating to partnership research, such as responding to discussions concerning research space, depending on circumstances.

The KLL also actively promotes the adoption of public funding by gathering and publicizing information on funding sources such as public subscriptions for competitive research funds from government and research grant from public utility foundations, and not just private funding. It also provides, with a support of Office of Research Administration at Yagami, an environment in

which researchers can be reassured about the utilization of research funding after such adoption, in response to research funding management and account audit.

### Commissioned Research Projects

(titles below are as given at the time of selection)

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

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

#### "Development of Semiconductor Nano-CMOS Process Simulator"

Japan Science and Technology Agency  
Kohei Itoh, Professor, School of Fundamental Science and Technology

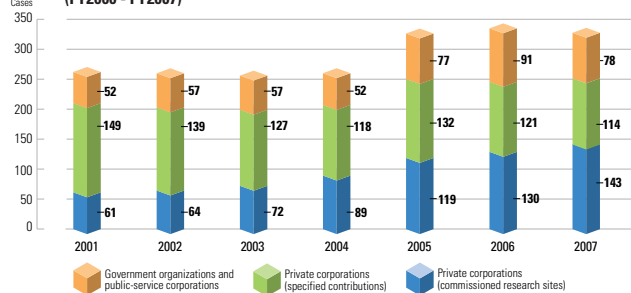
#### "λ Access Project"

National Institute of Information and Communications Technology  
Naoaki Yamanaka, Professor, School of Science for Open and Environmental Systems

#### "Research and Development of Polymer Electrolyte Fuel Cell Systems, Research and Development of Polymer Electrolyte Fuel Cell-Multi-points and Real-time Measurements of Water-content in PEM and Current through the use of small NMR Coils"

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

Numbers of Commissioned Research Projects and Other Cases Received (FY2000 - FY2007)



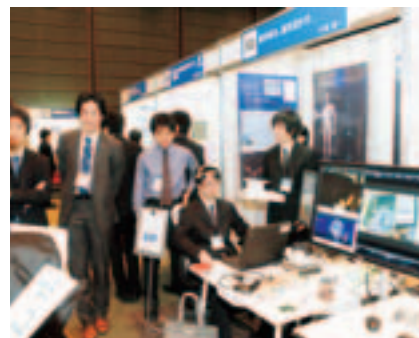
## Returning of Research Achievements to Society

Every December, the KLL holds the Keio Techno-Mall, which is a science and technology exhibition aimed at corporations.

In 2007, there were 60 booths introducing research achievements, which were visited by over 1,200 attendees. (In 2008, the exhibition is scheduled for November 19 in Halls B7 and B5 of the Tokyo International Forum in Yurakucho.)



Scene at the Keio Techno-Mall 2007 exhibition



Demonstration at a booth at the Keio Techno-Mall 2007

## Shinanomachi Campus



### Research Centers

## Shinanomachi Campus

### Center for Translational Research: From Bench to Bed

### For Inquiries:

#### Office of Research Administration at Shinanomachi

TEL: +81-3-5363-3879

E-mail: [ras-shinanomachi@adst.keio.ac.jp](mailto:ras-shinanomachi@adst.keio.ac.jp)

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

#### Keio University Medical Science Fund

TEL: +81-3-5363-3609

E-mail: [k-msf@adst.keio.ac.jp](mailto:k-msf@adst.keio.ac.jp)

<http://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 (second-year to sixth-year students), the Faculty of Nursing and Medical Care (third-year students), the Graduate School of Medicine, and the University Hospital. The Research Park is set up in the Center for Integrated Medical Research to promote research in the life-sciences fields, enabling researchers from a number of different fields to form research groups and promoting strategic joint research based on objectives that are common to the medical and life sciences. The Center for Clinical Research is established within the Building for Clinical Research, which was completed in 2008, to provide support for clinical trials and translational research.

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



Shinanomachi Campus

## 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 the various problems caused by the presence of independent departments, Professor Kitasato instituted a large-class system, which emphasizes cooperation between basic and clinical medicine and also the practice of medicine as a practical science. The doctoral program of the Graduate School of Medicine was established in 1956 and the master's course in 1994, to endeavor to foster trustworthy medical personnel who combine knowledge, technology, and an abundance of humanity, while seeking out and embodying the medical education that Professor Kitasato had envisioned.

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



Kitasato Memorial Library

## 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 generously to society by returning the fruits of Keio's research activities. The Research Park provides space for combined units formed of researchers from various different backgrounds who share common objectives, enabling expansion of diverse research within limited timeframes.

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



Institute of Integrated Medical Research

## Center for Clinical Research (CCR)

The Center for Clinical Research is a new organization in which the School of Medicine and the Keio University Hospital combine to conduct clinical trials and clinical/translational research toward helping to develop innovative cutting-edge treatments and revolutionary drugs. The Center also provides the functional support and personnel education required for such research activities. The intention is to provide a systematic framework that implements and supports clinical research and trials by the School of Medicine, the Keio University Hospital, and affiliated facilities, from a framework that enables clinical research by individual investigators or clinical departments.

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



Building for Clinical Research

## Keio University Hospital

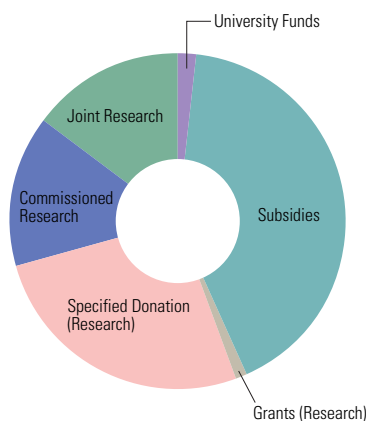
The University Hospital contains 27 treatment departments and 13 central treatment groups, handling an average of 4,000 out-patient visits per day, and an average of 950 in-patients. The hospital also accepts over 20,000 emergency patients a year, and handles 10,000 general-anesthetic surgery cases per year. The hospital also provides advanced treatments as a tertiary hospital, and also provides regional medical care through staff exchanges and medical collaborations with 110 hospitals all over Japan.

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



University Hospital

### Research Funds at Shinomachi Campus



(All yen amounts in thousands)

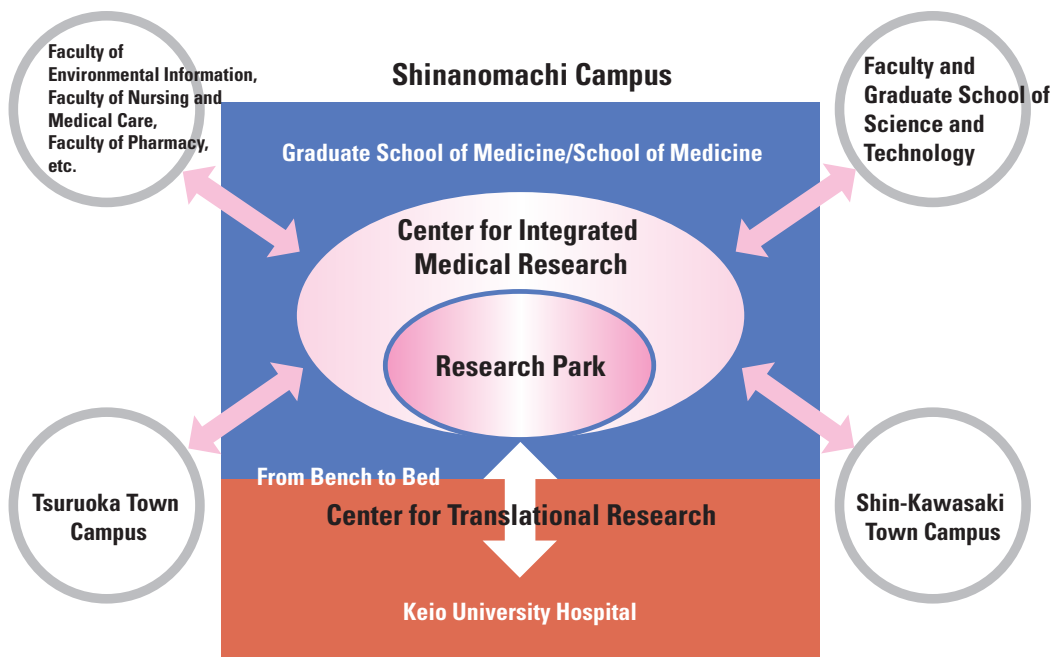
University Funds	128,973
Subsidies	3,040,353
Grants (Research)	80,377
Specified Donation (Research)	1,929,442
Commissioned Research	1,066,004
Joint Research	1,080,723
<b>Total</b>	<b>7,325,872</b>

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

- Suntory Advanced Cardiac Therapeutics
- Nisshin-Kyorin Asahi Medical Clinical Research Center of Inflammatory Bowel Disease
- Bridgestone Laboratory of Developmental and Regenerative Neurobiology
- Johnson & Johnson Ocular Surface and Visual Optics
- JMM Musculoskeletal Reconstruction and Regeneration Surgery
- Inaida Laboratory for Anti-Aging Ophthalmology
- 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 Hematologic Malignancy
- Novartis Pharma Program for Cerebrovascular Disease Prevention Medicine
- Department of Cell Biology and Neuroscience
- Department of Advanced Treatment for Spine and Spinal Cord Diseases
- Schering-Plough Center for the Study of Chronic Liver Diseases
- Anti-Aging Musculoskeletal Research
- Molecular Metabolism and System Medicine
- Daichi Sankyo Cardiovascular Inflammation
- Tokyo Electric Power Company Leading-Edge Medical Science and Environmental Preventative Medicine
- Integrated Renal Replacement Therapy and Translational Medicine
- Frontier Medicine on Metabolic Syndrome

### Joint Research Projects

- Novartis Pharma K. K.**  
Exploratory research for new therapeutic targets in cardiorespiratory medicine
- Institute of Medicinal Moleclar Design Inc**  
Renoprotective Drug Development targeted to NFκB
- Ono Pharmaceutical Co., Ltd.**  
Pathology of acute lung damage and clarification of molecular structure of convergence and repair capabilities
- Noevir Co., Ltd.**  
Noevir-Keio Translational Research Laboratory: Dept. of Cell Biology and Neuroscience
- Kowa Company, Ltd.**  
Clarification of the physiological role of oxidant stresses in dry-eye syndrome and exploratory research into novel dry-eye therapies
- Shionogi & Co., Ltd.**  
Clarification of molecular structures in renal aging and cardiorenal linkages, and clinical application to cardiovascular accident outbreak control of chronic kidney disease
- Mitsubishi Tanabe Pharma Corporation**  
Creation and functional evaluation of artificial blood platelets by nanoparticles supported by molecule recognition sites
- Daichi Sankyo Co., Ltd.**  
Keio-Daichi Sankyo Project on Genetics of Thrombosis
- Toshiba Medical Systems Corporation**  
Non-invasive radiotherapy and diagnostic system for cancer management
- 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
- LinkGenomics, Inc**  
Development program from diseases caused by epithelial-to-mesenchymal transition (EMT)
- Ajinomoto Co., Inc.**  
The pharmacological action of amino acids in Crohn's disease and analysis of changes in amino acid metabolic balance under pathology
- Kirin Pharma Company, Limited.**  
Analysis of undifferentiated sustainability and self-renewal mechanism of haematopoietic stem cells



Seminar



Research Park



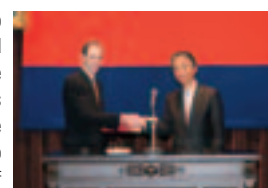
University Hospital

### Keio University Medical Science Fund

In Fall 1994, Dr. Mitsunada Sakaguchi, a 1940 alumnus of the School of Medicine, donated five billion yen to Keio, with the express desire 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. A further sum of two billion yen was added to the Fund in July 1999, 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 outstanding and creative research achievements that contribute to the development of medical-related sciences in the fields of medical or life sciences. The recipients can be of any 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 is held at Keio University, which also holds commemorative lectures and symposiums featuring the recipients.





**Shonan Fujisawa Campus (SFC)**

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

**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

**Website of Keio Research Institute at SFC:**  
<http://www.kri.sfc.keio.ac.jp/en>

**SFC**

The Shonan Fujisawa campus (SFC) was established in 1990 with the aim of creating a site for research and education based on completely new concepts adapted to the changing times. In addition to the three faculties of Policy Management, Environment and Information Studies, and Nursing and Medical Care, it also has the Graduate School of Media and Governance, which aims to foster highly professional people who will play a major role in 21st Century society, and the Graduate School of Health Management, which further expands and develops the concept of the Faculty of Nursing and Medical Care by providing a program that enables graduates of both the sciences and humanities to tackle the broad subject of "Health". Situated on a futuristic 330,000 square meter campus, SFC seeks to maintain a balance between advanced 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 institute of the three SFC faculties and the 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 within Japan and overseas.

Specific measures to achieve these objectives include the promotion of joint research projects with other organizations and the support of venture incubation efforts. A feature of the Keio Research Institute at SFC is the SFC Research Consortium, which encourages university-led collaborative research by multiple organizations. There are currently 11 such projects under way (as of June 1, 2008).

The Institute has also been commissioned to execute about 190 research projects per year, funded by approximately ¥1.7 billion from government agencies, local governments, and private companies (FY2007 data).

This research is performed not just by researchers within SFC, but also by approximately 400 visiting researchers from outside.

The Institute is committed to presenting the fruits of its research widely to the public so that the results of its efforts can be returned to society.

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

**Making Research Achievements Available to the Public**

**SFC Open Research Forum (ORF)**

The Keio Research Institute at SFC believes that returning the fruits of research to society is an important social duty. In order to make achievements widely available to the public, the Institute organizes an annual SFC Open Research Forum where various research projects at the Institute are presented 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. The Institute also holds panel discussions between industrial and political experts, and formulates proposals based on those discussions which it offers to society. These efforts aim to facilitate and strengthen cooperation between industry, government, and academia and simultaneously incorporate external feedback into the planning of future research projects. The two-day SFC Open Research Forum 2008 will be held November 21 and 22 at Academy Hills 40, Roppongi, Tokyo.

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

**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-based search service that allows users to search for research projects by keyword or researcher name. By creating opportunities for bringing societal needs together with SFC research activities, we hope to encourage cross-discipline research, with the creation of new research projects and related benefits such as technology transfer and the development of new businesses.

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



The Campus in Fall

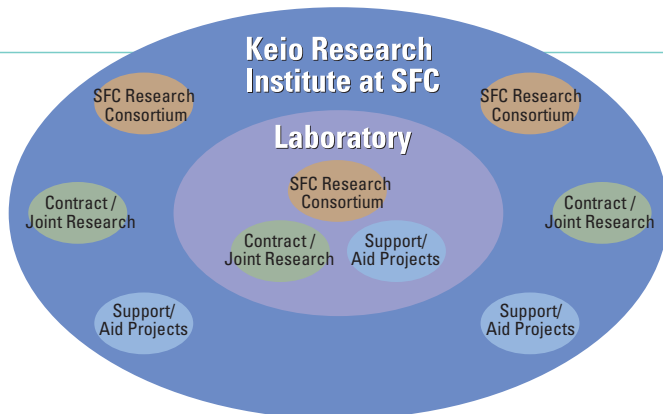


SFC Open Research Forum 2007



Yellow Pages





## World-Leading Fusion Research Technology

### Laboratory

The Keio Research Institute at SFC provides a laboratory system which enables SFC's researchers to form research groups with people who have different academic backgrounds yet share the same research interests and objectives. These groups carry out interdisciplinary collaborative research projects. Currently, the following 14 laboratories are in operation (as of June 1, 2008):

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

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

### SFC Research Consortium

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

Currently, the following 11 consortium projects have been organized (as of June 1, 2008):

- Building Advanced Information Infrastructure
- Sharing Human Intellect Project
- VCOM
- VSI (Virtual Systems Institute)
- E-CELL Consortium
- DVTS (Digital Video Transport System) Consortium
- MNET: (Digital Media Learning NETwork)
- e-Care Consortium
- Keio SFC Innovation & Entrepreneurship Platform 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>

## Case Studies

### Case Study 1:

#### Keio SFC-DNP Seminar

The Keio SFC-DNP Seminar is a collaborative project with Dai Nippon Printing Co. Ltd. (DNP) that seeks out a vision of the future aimed at the realization of an "emergent society". Some of the results that have promoted this joint research are a book entitled *"The Emerging Society"* (published November 27, 2006) and a booklet entitled *"Hints for Inducing Emergence"* (published September 1, 2007). In FY2008, we look forward to a new phase that will focus on substantive experiments.



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

### Case study 2:

#### Yoshiyasu Takefuji, Professor, Faculty of Environment and Information Studies: Power-harvesting project

The Takefuji Laboratory is currently working on "power harvesting" projects that take various forms of energy that have been wasted in the past and convert them into electrical power.

There are various ways of harvesting power, such as utilizing the minute vibrations of sound or the difference between a high temperature and a low temperature to generate electricity. One of these is a "power-harvesting mat" that uses the vibrations of people walking to generate electricity. This would make it possible to turn on an LED device as soon as someone gets up in the night to go to the bathroom, to light the way to the bathroom, or supply electrical power to an automatic ticket gate as passengers walk over the mat while passing through that gate. An experiment designed to test the commercial viability of this mat in practice is being conducted as joint research with the railway company JR East Japan.

Kohei Hayamizu, a member of this laboratory, has formed Soundpower Corporation as an SFC-inspired venture to work on bringing some of these projects to market.

There has been much media attention focused on technology that makes use of sound or vibration energy which was previously wasted without being used in any way, particularly nowadays when environmental problems are such a concern, and the Laboratory is proceeding with collaborations with companies in various different fields.

<http://www.neuro.sfc.keio.ac.jp/>

## Ground-Breaking Partnerships with Industry, Government, and Academia

### SFC Forum

The SFC Forum is a place where leaders of the business world and university staff can discuss the reorganization and creation of the new "knowledge" required by the current age. By enabling its members to share a wide range of ideas and perspectives, the Forum helps them anticipate issues and build a vision of the future.

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



SFC forum

### Venture Incubation Support

Keio University has set up incubation facilities (the Keio Fujisawa Innovation Village) in cooperation with the Organization for Small & Medium Enterprises, Fujisawa City, and Kanagawa Prefecture.

These facilities are offered for rent, subject to local conditions suitable for industrial startups, to



Keio Fujisawa Innovation Village

those who wish to utilize the fruits of university research to create new businesses, or to those who wish to form new companies in partnership with university researchers who already have suitable expertise.

A number of incubation managers are available on-site to give support such as advice on industrial startups and matchmaking with corporations.

Since the initial public offering in November 2005, the facilities have maintained an occupancy ratio of over 90%, and activities leading to industrial startups are continuing.



## Shin-Kawasaki Town Campus

### Open and Cutting-edge Research Facility Pursuing Industry-Government-Academia-Region Collaboration

**Shin-Kawasaki Town Campus**  
**Shin-Kawasaki Frontier Research and Education Collaborative Square**  
 7-1 Shin-Kawasaki, Saiwai-ku, Kawasaki, Kanagawa, 212-0032 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 K<sup>2</sup> 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. K<sup>2</sup> ("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 Education Collaborative Square was established as a frontier research organization within Keio University.

This roughly two-hectare site surrounded by greenery has four two-story research buildings and one welfare building where a total of approximately 330 (as of April 2008) researchers, including faculty members, graduate students and joint researchers, work day and night to advance research.

In FY 2007, 14 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 K<sup>2</sup> Town Campus also held open seminars (three seminars were held in FY2007), 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-Region Collaboration

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 K<sup>2</sup> 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

12 frontier research projects rooted in industry-government-academia collaboration were carried out across faculties and research courses, with a staff of over 330 researchers (including faculty members, 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 Society 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 FY2007 \*\* New Project starting in FY2008

K-Building	<b>Genome-based Drug Discovery Project</b> Masaya Imoto (Professor, Faculty of Science and Technology) *
K-Building	<b>Project on Search and Development of Intriguing Chemicals for Health Foods</b> Daisuke Uemura, Professor, Faculty of Science and Technology **
K-Building	<b>CREST 3D Display into Space Project</b> Hideo Saito (Professor, Faculty of Science and Technology)*
K-Building	<b>New Generation Terabit Core/Access Network Research Project</b> Naoki Yamanaka (Professor, Faculty of Science and Technology)**
K-Building	<b>Experimental Research Project on Autonomous, Distributed, Cooperative Control by Space and Outdoor Robots</b> Kazuo Yoshida (Professor, Faculty of Science and Technology)*
K-Building	<b>Technology of Air Cleaning for Creating the Comforts of Life</b> Shigeru Tanaka (Professor, Faculty of Science and Technology)
K-Building	<b>Project on Developing High Reliability of Devices with Mechanical Contacts</b> Toshiyuki Murakami (Professor, Faculty of Science and Technology)
K-Building	<b>Visible Light Communication Project</b> Yoshinori Matsumoto (Associate Professor, Faculty of Science and Technology)*
K-Building	<b>Project on Development of Integrated Communication Network Technology by Visible Light Communication</b> Masao Nakagawa (Professor, Faculty of Science and Technology)**

K-Building	<b>Distributed Real-time Processing Project</b> Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)
K-Building	<b>Building NEDO Device Development Project for Next Generation Robot Motion Control</b> Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)*
E-Building	<b>ERATO-SORST Koike Photonics Polymer Project</b> Yasuhiro Koike (Professor, Faculty of Science and Technology)
I-Building	<b>High-Level Global Cooperation for Leading-Edge Platform on Access Spaces</b> Kouhei Ohnishi (Professor, Faculty of Science and Technology)
O-Building	<b>Next Generation Nano-technology Thin Film Project</b> Seimei Shiratori (Associate Professor, Faculty of Science and Technology)
O-Building	<b>The WIDE Project</b> Jun Murai (Professor, Faculty of Environment and Information Studies)
O-Building	<b>Future Vehicle Project</b> Hiroshi Shimizu (Professor, Faculty of Environment and Information Studies)
O-Building	<b>Co - Mobility Society Creation Project</b> Yuichiro Anzai (President, Keio University)

**From MEXT Global COE Program "High-Level Global Cooperation for Leading-Edge Platform on Access Spaces."**  
 Began in FY2007 at K<sup>2</sup>



**From "Creation of Innovation Centers for Advanced Interdisciplinary Research Areas" of MEXT Special Coordination Funds for Promoting Science and Technology "Creation of Co-Mobility Society"**  
 Began in FY2007 at K<sup>2</sup>



**FY2007 Open Campus** (14 Project Exhibits) November 17, 2007 13:00-17:00

The Open Campus began with greetings from Yasuhiro Koike, Deputy Director of K<sup>2</sup>, Takao Abe, the Mayor of Kawasaki City, and Shigeya Kaburaki, the Chairman of Kawasaki City Representative Assembly and was attended by many residents, students, and individuals from businesses, among others.

**FY2007 Open Seminars**

DD/MM/YY	Instructor	Topic
17/11/07	Seimei Shiratori, Associate Professor, Faculty of Science and Technology (O-building project)	Wet Process Nano Coating and its Practical Applications
17/11/07	Yasuhiro Koike, Professor, Faculty of Science and Technology (E-building project)	IT Society Lead by Photonics Polymer, Where One Remembers Human
02/02/08	Kouhei Ohnishi, Professor, Faculty of Science and Technology (I-building project)	Haptic Interface—Toward Distant Surgery With Haptic Robot—

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 FY2007, a total of three open seminars were held that were attended by many participants. Additionally, numerous seminars are also planned for FY2008.

**Business Matching for Small and Medium-sized Enterprises**

On February 2, 2008, the Ohnishi lab, which has been working on research of remote medical robots with tactile perception, was visited by people with a focus on local businesses to discuss the possibility of manufacturing and the joint development of prototypes.

**The K<sup>2</sup> Corner on Kawasaki FM**

From January 2005, the Shin-Kawasaki Town Campus (K<sup>2</sup> Town Campus) is being presented on radio by Kawasaki FM 79.1. Once every month a researcher of the K<sup>2</sup> 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 <sup>2</sup> '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 Hopes 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 <sup>2</sup>
17/07	Professor Hideo Saito	3D Displays into Space Using Laser Plasma Light
11/09	Associate Professor Seimei Shiratori	Coating Technology Using Wet Process Nano Technology
16/10	Professor Kouhei Ohnishi	High-Level Global Cooperation for Leading-Edge Platform on Access Spaces (G-COE)
13/11	Chief Administrator Eiji Tomizawa	Topics on K <sup>2</sup> Open Campus 2007 and Open Seminars
18/12	Associate Professor Manabu Omae	The progress of Automotive Technology
2008		
15/01	Associate Professor Akihiro Tagaya	Research and Development of Plastic Optical Fibers and Liquid Crystal Displays
11/03	Chief Executive of Venture Firms Born from K <sup>2</sup>	Now and future, K <sup>2</sup> -based University Ventures
15/04	Professor Yoshiaki Ohkami	Design and Management of Large Scale Space System
13/05	Professor Daisuke Uemura	Development of Health Foods and Drug-leads from Naturally-occurring Organic Compounds
17/06	Lecturer Hideaki Yoshifuji Research Associate Yuji Sekiya	WIDE PROJECT Creating a Global Connection between Computers and All Other Equipments



Prototype exhibition



Open seminar

**Kanagawa Shimbun**

The column "Campus NOW" written by Chief Administrator Eiji Tomizawa in the newspaper Kanagawa Shimbun posts hot topics about the Shin-Kawasaki Town Campus (K<sup>2</sup> 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 <sup>2</sup> Continues to Evolve
20/04/07	K <sup>2</sup> Continues to Evolve
22/06/07	Research Begins... and Results are Passed On
17/08/07	Aiming for a New Society

**Media Coverage**

The K<sup>2</sup> Town Campus was introduced on various TV programs, including NHK's "Good Morning Japan," NHK's "Bakusho Mondai no Nippon no Kyooyoo," "TV Tokyo's "World Business Satellite," and TBS News, etc.

**Visiting Guests**

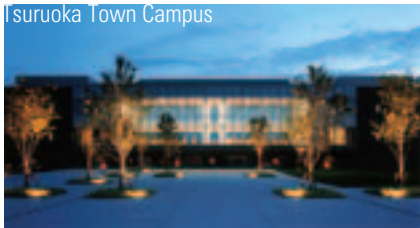
The Shin-Kawasaki Town Campus (K<sup>2</sup> Town Campus), keeping foremost in mind collaboration between industry, government, and academia, supports visits from businesses, organizations, and media to show its leading-edge research being pursued daily.

**Principal Guests in FY2007**

- Kawasaki City Council Members (Saiwai Ward)
- Primary Teachers of Yokohama City
- A Group of Beginning Teachers of Junior High School for Science Education Training
- The Chief Director of the Kawasaki Chamber of Commerce and Industry, and Others
- A Group of Delegation from Vietnam Government

Guests of K<sup>2</sup> inspecting various research projects

## 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](mailto:office@ttck.keio.ac.jp)  
<http://www.iab.keio.ac.jp/>

In April 2001, Keio University established Tsuruoka Town Campus of Keio (TTCK) in Tsuruoka City, Yamagata Prefecture, with the cooperation of Yamagata Prefecture and the municipalities of 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, Keio University, located in Tsuruoka city, Yamagata prefecture, is a pioneer in the new life science field of "Integrated Systems Biology".

Using cutting-edge biotechnology, intracellular metabolites can be analyzed comprehensively to construct computer simulation models and that can be applied in fields such as medical science and also the food industry.

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

## Major Research Projects

### Ministry of Education, Culture, Sports, Science and Technology

#### •Global COE Program

Global COE for Human Metabolomic Systems Biology (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" (2007-2009)

#### •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" (2007-2008)

#### •Grant-in-Aid for Cancer Research

"Research on Development of New Medical Treatment Based on Cancer Biology: Cancer metabolomes" (2005-2008)

### New Energy and Industrial Technology Development Organization

#### •Functional RNA Project

"Analysis of the functions of functional RNA" (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" (2006-2009)

#### •Bioinformatics Operations

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

#### •Comprehensive Support Programs for Creation of Regional Innovation

Science and Technology Incubation Program in Advanced Regions

"Protein Phosphorylation Display for Drug Discovery and Diagnosis" (2008-2010)

### Yamagata Prefecture and Tsuruoka City

"Development of Fundamental Technologies Using Systems Biology (Simulations Software Techniques, Metabolome Analysis Techniques, Genome Design 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., BioSigma S.A. (Chile), Denso Corporation

## 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 FY2007, 40 students in the spring semester and 35 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) of 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 Human DNA and analyzes the gene for alcohol-degrading enzymes, and diagnoses through genetic testing 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.

### Systems Biology Program

This 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 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 94 participants in FY2007.

### 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 18 participants in FY2007.

### Keio Summer Bio Camp

This is a basic hands-on program in biotechnology for any high school students from all over Japan. There were 15 participants in FY2007.

### Spring Science Camp

This is a basic hands-on program in biotechnology for any high school students from all over Japan. (Sponsored by: Japan Science and Technology Agency) In FY 2007, 16 students participated.

## Other Related Facilities

Tsuruoka Metabolome Campus was founded in 2005 as a research facility by Tsuruoka City which aims at cluster formation of bioresearch and development with IAB as its cornerstone. In addition to IAB's Metabolome group, Human Metabolome Technologies Inc., RIKEN, Keio University's School of Medicine, Nishikawa Keisoku Co., Ltd., BioSigma S.A. (Chile), and Spiber Inc. are on the campus conducting research.



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, 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 signed contracts for 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.



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



Tsuruoka Metabolome Campus

## 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"

# The Global COE and 21st Century COE Programs

Under the 21st Century Center of Excellence (COE) program, which is one of the leading sources of competitive research funding in Japan, a total of 12 programs from Keio University were adopted in 2002 and 2003. These programs produced a succession of achievements, and all of them have ended as of March 2008. These programs have also been developed into global COE programs, either singly or as amalgams of two programs. Three programs were adopted in 2007 and four in 2008, so that seven global COE research and education centers have now been set up.

Each of these programs proposes a further development of the research and education centers that were constructed under the 21st Century COE program. In review, they were evaluated on the basis of the track records of their activities under the 21st Century COE program, their research plans and doctoral programs over the next five years in the light of those records, and plans to nurture world-class scholars focusing on doctoral programs.

Each research and education center in the global COE program was established within the Keio Advanced Research Centers, which are organized in February 2007 under the leadership of Yuichiro Anzai, President of Keio University, to ensure mobility without any boundaries imposed by faculties or graduate courses.

These programs are expected to develop world-class research facilities and also establishments that cultivate scholars, while retaining partnerships with existing graduate schools.

## Centers Selected in the Global COE Program

Page	Adopted Year	Field	Home Campus *	Program title	Program Leader
P.30	2007	Life sciences	Shinanomachi	<b>Global COE for Human Metabolomic Systems Biology</b>	Makoto Suematsu, Professor, Graduate School of Medicine
P.30	2007	Information sciences, electrical and electronic sciences	Yagami	<b>High-Level Global Cooperation for Leading-Edge Platform on Access Spaces (GC0E)</b>	Kouhei Ohnishi, Professor, School of Science and Technology
P.31	2007	Humanities	Mita	<b>Center for Advanced Research on Logic and Sensitivity</b>	Shigeru Watanabe, Professor, Graduate School of Human Relations
P.29	2008	Medical sciences	Shinanomachi	<b>Education and Research Center for Stem Cell Medicine</b>	Hideyuki Okano, Professor, Graduate School of Medicine
P.29	2008	Mechanical, civil engineering, architectural and other fields of engineering	Yagami, Hi-yoshi	<b>Center for Education and Research of Symbiotic, Safe and Secure System Design</b>	Takashi Maeno, Professor, Graduate School of System Design and Management
P.29	2008	Social sciences	Mita	<b>Raising Market Quality - Integrated Design of Market Infrastructure</b>	Naoyuki Yoshino, Professor, Graduate School of Economics
P.29	2008	Social sciences	Mita	<b>Designing Governance for Civil Societies</b>	Yoshihisa Hagiwara, Professor, Graduate School of Law

## Centers selected in the 21st Century COE Program

Page	Adopted Year	Field	Home Campus *	Program title	Program Leader
P.33	2003	Medical sciences	Shinanomachi	<b>Establishment of Individualized Cancer Therapy Based on Comprehensive Development of Minimally Invasive and Innovative Therapeutic Methods</b>	Yutaka Kawakami, Professor, Graduate School of Medicine
P.33	2003	Medical sciences	Shinanomachi	<b>Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches Based on the Development of Experimental Animal Models</b>	Hideyuki Okano, Professor, Graduate School of Medicine
P.34	2003	Mathematics, physics, earth sciences	Yagami	<b>Integrative Mathematical Sciences: Progress in Mathematics Motivated by Natural and Social Phenomena</b>	Yoshiaki Maeda, Professor, Graduate School of Science and Technology
P.34	2003	Mechanical, civil, architectural and other fields of engineering	Yagami	<b>System Design: Paradigm Shift from Intelligence to Life</b>	Takashi Maeno, Professor, Graduate School of Science and Technology
P.31	2003	Social sciences	Mita	<b>Development of a Theory of Market Quality and an Empirical Analysis Using Panel Data</b>	Naoyuki Yoshino, Professor, Graduate School of Economics
P.32	2003	Social sciences	Mita	<b>Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World</b>	Yoshiaki Kobayashi, Professor, Graduate School of Law
P.32	2003	Social Sciences	Shonan Fujisawa	<b>Policy Innovation Initiative: Human Security Research in Japan and Asia</b>	Jiro Kokuryo, Professor, Graduate School of Media and Governance

\* Home Campus: Affiliate region of research representative

### Education and Research Center for Stem Cell Medicine : Hideyuki Okano, Professor, Graduate School of Medicine

There are stem cells in basically all the organs of the living body and they are closely linked to the pathologies and treatments of various illnesses. We are convinced that building a education and research framework centered on stem cells will enable us to contribute to dramatic improvements in the driving forces of all education and research in the doctoral programs of the Graduate School of Medicine. In this global COE (GC0E) program, the Education and Research Center for Stem Cell Medicine creates the academic field of Stem Cell Medicine, which is a concept that covers an even wider ranging area of medicine based on the foundation of the personnel fostering strategies and stem cell medical education and research center that were set up previously by the Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology of the 21st Century COE (21COE) program, to cultivate young scientists who are full of focus and independence in education and research. By a reorganization of graduate courses in order to develop world-leading human resources, this center hopes to: (1) Create a virtuous cycle of building a series of education and research structures and developing human resources (acquisition of "capacity for self-renewal"); (2) Cultivate versatile personnel (acquisition of "multipotentiality"); and (3) Form partnerships with Lund University, Texas University MD Anderson Cancer Center, and the University of California, Irvine, to exchange personnel to build an international cooperation framework (acquisition of "migratability").

### Center for Education and Research of Symbiotic, Safe and Secure System Design : Takashi Maeno, Professor, Graduate School of System Design and Management

One aspect of the increasing sophistication of science and technology is a specialization and focus on details concerning elemental technology. As technological systems such as electrical generation systems, energy systems, transportation mechanisms, and robots become larger in scale and more complex, we are faced with complications and many challenges involving unforeseen accidents and global environment problems that cannot be handled by specialists and detailists alone. To resolve such problems and design and manage large-scale complicated systems accurately, it is necessary to study complicated interactions between a variety of values that differ in category and scale, such as safety concerns, global environment problems, and the design objectives of systems and individual elements, and comprehend them as system relationships. It is also necessary to organize the field of system design engineering that deals with the design of entire systems systematically, and develop research and education into creative system design on that basis. That is why Keio University has conceived a research and education center for nurturing world-class personnel capable of being leaders in Symbiotic, Safe and Secure System Design globally, based on the world's most advanced system design engineering establishments and international partnership training establishments that have already been set up.

### Raising Market Quality - Integrated Design of Market Infrastructure : Naoyuki Yoshino, Professor, Graduate School of Economics

This global COE establishes a new economic viewpoint for comprehending the marketplace itself from within, and clarifies the dynamism of raising market quality in real-world economics. To that end, the aggregate of the various elements that surround the marketplace, such as laws, institutions, organizations, cultures, ethics, and customs is called the market infrastructure, and we clarify the dynamic relationship between market quality and market infrastructure.

The center hopes to advocate new economic policies that integrate theory and empirical results. The following four research groups work closely together to provide research and education, to cultivate large numbers of young scholars that will shine worldwide. (i) Theory development department: centered on Makoto Yano, who is an advocate of market quality, this department establishes an economic policy principle called "raising market quality" through coordination of the market infrastructure. (ii) Panel data design and analysis department: centered on Yoshio Higuchi, who has become a leader in the field of panel data design and analysis in Japan, this department designs and builds new corporate databases aimed at shedding light on the raising of market quality, to create a foundation for recommending policies that promote positive analysis, linking to budgetary data from 21COE. (iii) Application and positive analysis department: centered on Naoyuki Yoshino, this department strengthens our knowledge of positive analysis by panel data, with research into a wide range of fields such as individual marketplaces, corporate systems, law and economics, international economics, economics development, and history. (iv) Policies design and recommendation department: centered on Naoyuki Yoshino, this department enables the policy principle of this center relating to raising market quality to take root, to contribute to the recovery of Japan's economic strength and the development of global economics.

### Designing Governance for Civil Societies : Yoshihisa Hagiwara, Professor, Graduate School of Law

This center performs research and education on governance for civil societies at an international standard, with the objective of educating and cultivating internationally outstanding young scholars, while forming partnerships with other leading research and education centers around the world. This center analyzes what sort of multi-level effects are created by linkages between political attitudes and policy making within local governments, regional governments, regional organizations, and international society. Today there is growing awareness of the importance of governance through which citizens and policymakers can cooperatively address various problems. However, many issues remain unsolved. First of all, we must establish a clearer definition of governance. It is also necessary to discover and elucidate the "multi-level structure of governance" within which various factors interact in a complicated manner. Another important challenge is to incorporate current research accomplishments into political science education. Ultimately, this center aims to provide a new framework for analyzing democracy.

## Global COE for Human Metabolomic Systems Biology

Program Leader: Professor Makoto Suematsu, School of Medicine  
<http://www.gcoe-metabo.keio.ac.jp/index-e.html>

This global COE Program in Life Sciences aims to create a cutting-edge multidisciplinary research and education center that fosters young investigators who will promote a new field of Metabolomic Systems Biology. This area is composed of integrative components of life sciences involving medicine, chemistry, engineering, information technology and pharmacology. We are challenging to focus on regulatory mechanisms for metabolic systems under physiologic and pathophysiologic conditions. Fiscal 2007 marked the start of the Program, and we engaged in establishing the framework for education and research. Our four main achievements are as follows.

### 1. Humanized Animal Engineering Laboratory

The research center for the Humanized Animal Engineering Laboratory (HAL) started up in two locations: Shinanomachi campus research center and the Central Institute for Experimental Animals (CIEA), to examine common marmosets and super-immunodeficient mice. HAL is equipped to be a research facility capable of creating mice that express human chromosome, or those reconstituting human hepatocytes for dissecting mechanisms for regulating metabolism in human.

### 2. Integrative Research Institution with Overseas Partners

In November 2007, 14 members from Keio University (including graduate students and postdoctoral fellows) participated in a symposium for gas and water biology, held at Nobel Forum at Karolinska Institutet and the Royal Institute of Technology. We also held meetings with young researchers from Cardiovascular Proteomics Center at Boston University to plan solid collaborations. In July 2008, we will organize Summer School, an educational and research program spanning 5 weeks, which includes laboratory training and practice on bioimaging and metabolome analysis.

### 3. Educational Environment for Fostering Self-Reliant Young Researchers

The cornerstones of this Global COE program, Shinanomachi campus' Center of Integrated Medical Research and the Tsuruoka Metabolome Campus, form the research park incubation system that fosters young researchers. It provides limited-time research spaces and experimental facilities, and allowed the start of R&D of a next-generation bio-imaging system (multi-function confocal laser scanning microscope) for the analysis of brain metabolism and microcirculation. Also initiated was a system for gathering and analyzing small number of cells (using FACS and related advanced technology) to create a system for analyzing the metabolism of stem cells, as well as research for deciphering mechanisms of parasite metabolism.

### 4. Launching Clinical Bioinformatics Center and Liaison Office for Global Collaboration

To provide research and education services for young investigators, such as the study of human metabolomic systems biology and ethical education on the use of human biomedical informatics, we have expanded the capabilities of the cell and tissue bank located in the Center of Integrated Medical Research, and have installed a new center for clinical genomic information in the New Clinical Research Institute. We expect to manage these facilities with the support of the Global COE program in the future. We are preparing to establish a Liaison Office for International Collaboration for the GCOE in the Center of Integrated Medical Research, which serves as the main facility for this program. To assign full-time staff, we are now trying to secure human resources and arrange adequate environments.



Joint Meeting at Karolinska Institutet  
(November 2007)

### FY2007 Symposia and Meetings

October 22, 2007	Satellite Symposium for Metabolomic Systems Biology and Liver Diseases
November 7, 2007	Joint Meeting "Gas Biology and Medicine" Karolinska Institutet
November 8, 2007	Joint Meeting "Novel techniques in aquaporin research" Royal Institute of Technology
February 28-29, 2008	Global COE Program "Global COE for Human Metabolomic Systems Biology" general workshop
March 22, 2008	Mini Symposium "Genetic Disorder of Steroid Metabolism in Human Diseases"

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

Program Leader: Professor Kouhei Ohnishi, Graduate School of Science and Technology  
<http://www.gcoe.keio.ac.jp>

### 1. Introduction of Program

The Global COE Program, "High-Level Global Cooperation for Leading-Edge Platform on Access Spaces" was established to produce in great numbers scientists and engineers having rich humanity and skills of actively working in the international arena. The five-year program (from FY2007 to FY2011) is being carried out under the following framework.

### 2. Purpose of Research Center

This Global COE Program pursues new human-centered science and technology in order to offer digital support that meets requirements for individual activities. To this end, we need advanced systems having much higher performance than those based on the conventional information, electrical and electronic technologies. The key to achieve such systems is the coordinated research that integrates areas from optical/electronic devices to network communication and haptics. Our purpose is to establish this scientific and technological platform through high-level international cooperation on a global scale.

### 3. Content of Research Center Implementation

To provide advanced human support in access spaces, we are pursuing research that heightens synergistic achievements in the following 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."

### 4. Education Implementation Plan

This Global COE Program has employed 50 COE research assistants (RAs) and young researchers under a competitive scheme. Along with being tasked to learn the COE subjects prepared in the Graduate School, the RAs can also make use of double-degree programs; multiple supervisor systems including professors at overseas partnership locations; and international internships and overseas joint research collaborations. As a result, we will be able to establish career paths for young PhD-holding scientists and engineers that allow them to participate actively in the international arena. We also expect to produce new leaders who can be active in the global society.

### 5. Achievements in FY2007

(1) Strengthening of international cooperative centers network, NOE (Network of Excellence)  
 Signed memoranda of agreement with 27 international cooperative locations-an increase of nine locations.

(2) International workshops

Sponsored international symposia and workshops (three domestic, three overseas).

(3) Internship students

One student for a long-term internship and eight for short-term internships were sent to overseas research institutions to carry out collaborative research.

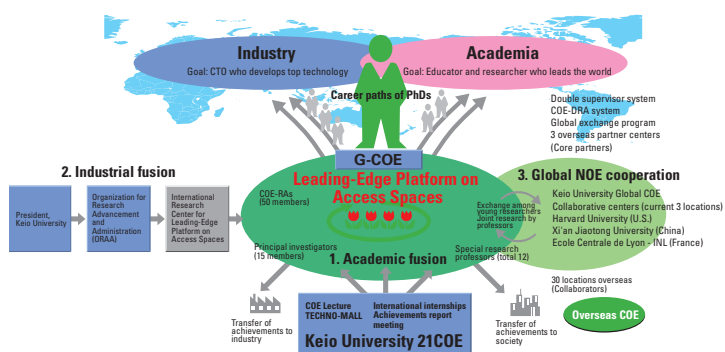
(4) Educational Programs

We held the "Leading-Edge Science and Technology" seminar and a lecture on "Ethics and Copyrights in Science and Technology". We also had six special lectures by prominent researchers for RAs and young researchers, and a winter camp organized by the RAs themselves.

(5) Others

We carried out new, never-been-attempted efforts, such as double-supervisor system and COE-RA original research support system.

In FY2007, our research achievements were going very well, with 162 published journal papers, 44 invited talks, and 206 presentations at academic conferences.



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

## Centre for Advanced Research on Logic and Sensibility

Program Leader: Professor Shigeru Watanabe, Graduate School of Human Relations  
<http://www.carls.keio.ac.jp/>

The "Centre for Advanced Research on Logic and Sensibility" began to take shape in July 2007. The program will train a new generation of researchers of logic and sensibility in human judgment who are capable of a more integrative approach, ranging from neural basis to cultural dependency including developmental changes, roles of linguistic judgments and philosophical underpinnings. Efforts in the first year were focused on acquiring research equipment, and we have now assembled functional MRI (fMRI) machine and equipment for experimenting with marmosets (new world monkeys) and conducting field research. We probably will not see results from this equipment until after 2008, but the program is progressing smoothly according to plan. In 2007, we held 28 international symposiums, sent a total of 21 researchers overseas, and invited 31 researchers from other countries to participate in symposiums in Japan. The Keio-Cambridge Joint Seminar provided an opportunity for a small number of young researchers from University of Cambridge and from Keio University to meet and discuss these issues, and was held in July with the support of the Global COE (GCOE) cooperative program at University of Cambridge. Later that fall, GCOE researchers were invited to deliver lectures through the cooperative program at the University of Vienna as part of the lecture series on "The Evolution of Social Cognition."

In February 2008, 12 foreign researchers were invited to participate in a three-day symposium at Keio University on "Rational Animal, Irrational Humans." The symposium brought researchers together from many different fields including neuroscience, psychology, animal behavior, cultural anthropology, and logic to discuss the rationality of human and animal judgments. In meetings held after the symposium, the participants brought out many valuable points that should be preserved, and we are now in the process of publishing the proceedings. The Tokyo International Forum was held as a symposium for a general audience, and Hideaki Sena, popular novelist and specially approved visiting professor at Tohoku University was invited to give a talk entitled "Arguing? Quibbling? or No Room for Quibbling?" The Global COE at Kyoto University also participated in this symposium. Two of the topics raised in this symposium, that were later

picked up in press releases in June 2008, included the development of the new field of pharmacological near infrared spectroscopy (NIRS) that combines NIRS (optical topography) for children and pharmacology, and new knowledge obtained even from self awareness in animals. We have also entered the actual implementation phase of a collaborative study with University of London on brain images of twins. Research results for 2007 have been compiled in Volume 1 of "CARLS Series of Advanced Study of Logic and Sensibility."



fMRI experimental equipment



Keio-Cambridge Joint Seminar (Held at Downing College, University of Cambridge)

## The 21st Century COE Program [Social Sciences] FY2003

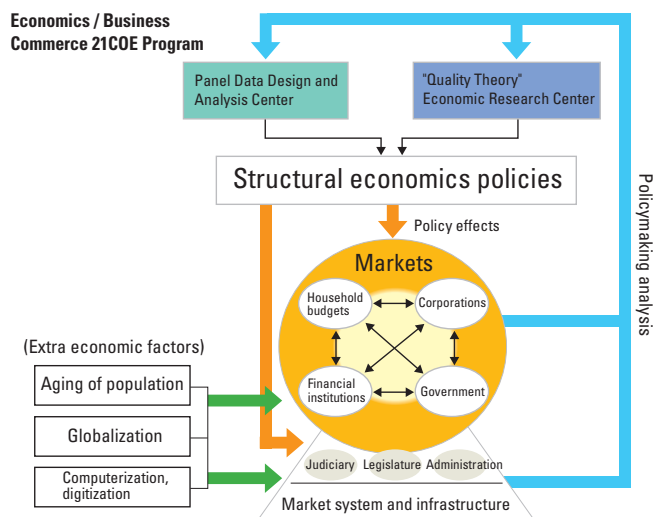
### Development of a Theory of Market Quality and Empirical Analysis Using Panel Data

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

To investigate "qualitative changes" of household budgets, this program collects cross-sectional micro data from the same Japanese households every year, then empirically analyzes behavioral changes in those households—changes in labor supply, housing investment, asset management, and other kind relevant behavior—over time. Keio University was the first university in Japan to undertake a research project to design and analyze this kind of panel data in a systematic way. We have also entered into a number of collaborative household panel survey projects with Princeton University, Erasmus University in Rotterdam, and other universities around the world (Yoshio Higuchi Group). The project is also examining qualitative changes in the behavior of banks from theoretical and empirical perspectives, and is conducting a factor analysis of the behavioral changes of companies and households that occurred during the lost 15-period since the 1990s. In the past, the policy recommendations of international institutions such as the IMF and World Bank for different countries were not necessarily made from the standpoint of improving the quality of those country's markets. In collaborations between Economics/Business Commerce 21COE Program and the UN (ESCAP), we have offered economic policy recommendations to many countries across the Asia-Pacific region including Thailand, Vietnam, Sri Lanka, and Mongolia with suggestions on how to allocate infrastructure funding (revenue bonds) so as to improve the quality of public policies. We have been actively involved in research and researcher exchanges with institutions around the world including Columbia University, the Brookings Institute, the University of Hawaii, and the State University of New York in the US; the Bruegel Research Institute in Brussels, the Paris Institute of Political Studies, the University of Gothenburg (Sweden) in Europe; and Renmin University of China, the Chinese Academy of Social Sciences, Thammasat University in Thailand, the Central Bank of Indonesia, the Malaysian Rating Corporation Berhad, the Korea Institute of Economic Policy, and the University of the Philippines in the Asia-Pacific region. The concept of "market quality" was first proposed by Makoto Yano in his book "Applied Micro Economics" (Iwanami Shoten), and provides the theoretical underpinnings for much of this research.

And for exchanging information domestically and around the world, Professor Naoyuki Yoshino has been instrumental in organizing an extensive international network including the UN (ESCAP), ASEAN, and key policy-making institutions throughout Asia that has facilitated numerous international joint research and joint project collaborations.

Thanks to extensive involvement of working-level officials and policymakers, research results have been made available through international academic journals ("International Journal of Economic Theory" published by Blackwell and the "Asian Economic Papers" published by MIT Press), sponsorship of international academic meetings, and cosponsorship of international conferences with the IMF, the Financial Services Agency, the European Central Bank, and the Bruegel Research Institute. This program has so far led to the formation of two research centers, the *Panel Data Design and Analysis Center* and the "Quality Theory" Economic Research Center, both of which are actively investigating ways to enhance market quality, as illustrated in the figure below.





## 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 21COE-CCC) is to "pursue the ordered establishment of a multi-cultural and pluri-generational political society." It focuses on research on public opinion 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 establishing an international research center.

### Promotion of International Collaborations

In 2007, the 21COE-CCC newly established the following international collaborations to promote joint research programs with overseas research institutes, particularly in Korea.

- Academic exchange agreements were signed with the Local Government Research Institute at Donggwi University (October 16, 2007), and with the Social Sciences Research Institute of Inha University, both in Korea.
- We have strengthened collaborative ties with other domestic and foreign research institutes, including Inha University and the National Youth Policy Institute in Korea and a number of Australian academic groups. Upon the request of these same institutions, we jointly organized many sessions at the 5th International Symposium.
- 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 61 researchers at 46 universities).

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

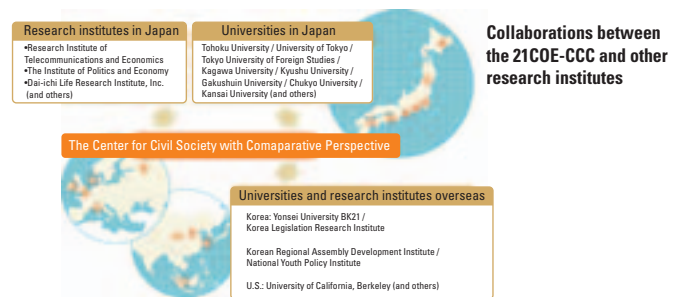
### International Activities

Through the international collaboration outlined above, the 21COE-CCC has undertaken the following international activities to disseminate research results to the world at large, and to build broad networks of researchers.

- We conducted a large-scale survey of civil society in Korea. Data input and analysis of results for 21 surveys conducted in 15 countries have been completed, and these data have been stored in a "Civil Society Data Archive" equipped with a multilingual search function in six languages (patent acquired). This archive has been made available to researchers worldwide as a comprehensive database on civil society research.

- The 5th International Symposium was held in November, with 119 invited speakers. There were a total of 80 research reports in 27 sessions, which were attended by 1,071 participants from Japan and around the world.
- Based on academic exchange agreements signed so far, international symposiums have been held three times in collaboration with three Korean universities: Yonsei University, Inha University, and Dongseo University (Keio University Mita Campus, Tokyo, on June 16; Inha University, Incheon, December 12-13; and Dongseo University, Pusan, February 11). These discussions and mutual exchanges of researchers and students between Japanese and Korean programs were the foundation for groundbreaking project in terms of deepening mutual insights, and a total of 22 research reports were presented.
- Volumes 8 & 9 of the European refereed "*Journal of Political Science and Sociology*" were published to provide a venue for international debate on civil society research (available in the libraries of 60 major overseas universities)

Up to now, the results of joint research activities between the 21COE-CCC and research partners inside and outside of Japan have been published in a total of 44 volumes in a series entitled "21COE-CCC." This series has been covered in numerous newspaper reviews, and three of these volumes have already been translated into other languages, prompting 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://coe21-policy.sfc.keio.ac.jp/en/index.html>

This research deals with integrated policy management (*sougou seisakugaku*) employing practical learning to identify and solve real public issues, and address practical tasks to achieve "human security research in three areas: (1) platform-building to promote "practical knowledge" learning (2) internationalization, and (3) training and education of young researchers. Our research activities this past year have continued to focus on platform-building and implementing a network that links collaborative institutions in Japan and abroad. Besides the full-scale launch of activities by the "Community Collaboration Laboratory" that was started last year, two other new SFC laboratories were organized: the "Asian Laboratory" and the "From SFC: Web-based Social Survey Report Laboratory." This past year, 27 working papers were published, thus bringing the total to 150 papers. In addition five volumes were added to the "*Integrated Policy Management Series*" in March 2008. In December 2007, we assembled an editorial team consisting of 8 editorial advisors from outside the SFC, 6 editorial board members from within SFC, and 10 editorial board members from outside SFC, and launched a new integrated policy management journal titled "*Keio SFC Journal: Special Issue on Policy Management*." Committed to train a new generation of young researchers, two COE Research Assistants received their doctorates this past year. This brought the total number of young researchers who have obtained doctorates in this COE program to nine. In terms of education, special emphasis placed on international development of integrated policy management. Two new courses have been added to the curricula of the International Advanced Degrees Program in the Graduate School of Media and Governance: "Policy Management I" focusing on development and human security, and "Policy Management II" highlighting policy formation and social innovations. Both courses are offered online so they can be taken anywhere in Japan or elsewhere with Internet access, thus contributing to internationalization of the integrated policy management. To promote networking among young researchers interested in domestic policy issues, we hosted teleconferencing research seminars and discussions among young researchers at Japanese universities that have policy management departments (Ritsumeikan, Kwansai Gakuin, Doshisha, Chuo, and Nanzan Universities).

One major achievement has been the development of a collaborative model uniting universities, government, NGOs, and other stakeholders in a number of key projects including a regional project in Thailand to combat high-level infectious diseases

(Chiangmai, San Kamphaeng, and San Patong), and a CDM forest project in China (Shenyang, Liaoning Province and Inner Mongolia Autonomous Region). We have also implemented a remote learning network that links five sites: Beijing, Taipei, Seoul, Tokyo, and Fujisawa. On the domestic front, we have made excellent progress on a number of joint projects with Research Satellites including an experimental cross-cultural education and learning project, a collaborative project to convert vacant stores into salons for the elderly, a joint project with intermediate support NPOs to revitalize local community, a project to train community-based entrepreneurs using information technologies. Through these and other projects, we learned valuable lessons including the fundamental importance of multi-stakeholder involvement and how best to plan projects based on the collaborative model with the university assuming the role of intermediate support organization. We have also moved from the development stage to practical implementation stage of a powerful system for analyzing vast amounts of textual content on the Internet. This will permit real-time decoding of other peoples' semantic worlds as never possible in the past which will enhance our capability to detect and solve real life problems.

On January 26, 2008, we hosted a symposium on "Policy Innovation Initiatives and Practices in Japan and Asia" to make some of our practical real-world achievements known to a wider audience, and also to reinforce the integrated policy management network. The content of the symposium was made available to the public in the form of streaming video on our website and also in the form of published working papers.



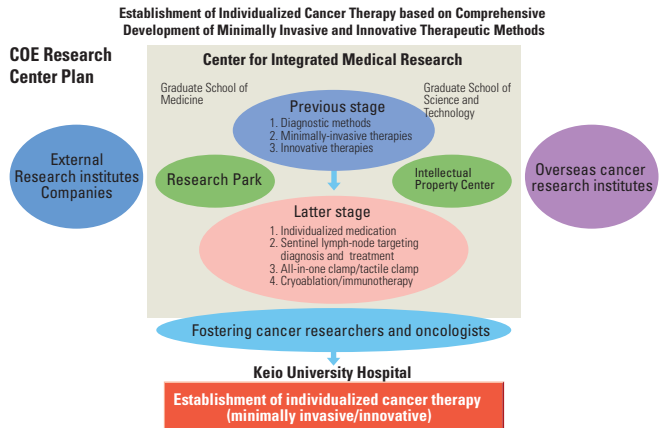
KEIO SFC JOURNAL Special Issue on Policy Management and SFC Policy Management series

## 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>

Fiscal 2007 marked the end of this 21st Century COE program in the Medical Sciences. By building on the research results of the previous stage, we advanced translational research with a focus on the development of new, minimally-invasive therapies. The projects are centered on four areas: 1) individualized medication based on characteristics of both cancer cells and patients, 2) development of diagnostic and therapeutic methods targeting sentinel lymph nodes, 3) development of high performance master-slave manipulators and tactile sensing technology in robotic surgery, and 4) development of minimally invasive therapy focusing on immunotherapy and cryoablation. As a result, we have been able to obtain results that are implementable in the near future as standard medicine. These results include individualized medication that reduces side-effects from anti-cancer drugs, individualized therapies based on cancer drug sensitivity tests, individualized minimally-invasive surgeries based on sentinel lymph node diagnosis, the development of master-slave all-in-one clamps and tactile-sensing clamps for minimally-invasive surgeries, cryoablation, and immunotherapies. We have also made numerous achievements in basic research; these seeds are expected to bear fruit for clinical applications in the future. At the international symposium "Individualized Cancer Therapy Based on Development of Minimally Invasive and Innovative Therapeutic Methods," held in October 2007, during which the 5-year progress report of this research center was also given, a member of the foreign external evaluation committee commented: "I was extremely impressed with the overall quality of the program. I was equally impressed with the tight linkage between the laboratory and the clinics, and by their translational philosophy. The COE program leadership understands the importance of training the future generation of investigators. All of these important components of education appear to be nicely emphasized in this COE." This demonstrates that the results of this COE program, which sought to create a world-class research center capable of performing university-based translational research and to foster next-generation cancer researchers and oncologists, was able to draw high praise

internationally. At the Graduate School of Medicine, we are already building a framework that will further develop the translational cancer research and education system realized by this COE program.



Program members and invited speakers at international symposium (October 2007)



Research center meeting

## 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/>

Fiscal 2007 was the last year of this 21st Century COE Program. A comprehensive survey of the five-year period was held as an international symposium in November. Many participants came from Lund University and Karolinska Institute of Sweden, partners of Keio University. By having exchanges among young researchers, promoting mutual visits, and building a system of joint research, we were able to make major advances in research and produce results.

On the research front, we are planning to start stem cells-based clinical research. This research was based on this COE's research results on stem-cell therapy on the basic level end, which confirmed its safety and effectiveness.

The joint research team assembled by this 21st COE Program, "Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology," has published in prominent journals on the following topics in the field of stem cells and cell regeneration: elucidation of hematopoietic stem cell niches (*Cell*), elucidation of control mechanism of hematopoietic stem cells by radical oxygen (*Nature*), establishment of complete purification technique of hematopoietic stem cells (*Immunity*), development of myocardial induction of embryonic stem cells (*Nature Biotech*), identification of factors activating adult neuronal stem cells (*PNAS*), elucidation of adult neuron migration (*Science*), induction of regeneration of damaged spinal cord by semaphoring 3A inhibitor (*Nat. Med.*), elucidation of new role of reactive astroglia in injury to CNS (*Nat. Med.*), and identification of human utero-stem cells (*PNAS*). Recently, we have achieved success by pioneering experimental treatment of spinal cord injuries in mice using iPS cells (article submitted). In the field of immunology, we have published world-class findings, such as the elucidation of the role of immune response in dendritic cells (*Nat Immunol*) and the analysis of pemphigus antigens (*J. Clin Invest, New Eng J Med*).

We wish to thank everyone who assisted and provided guidance for this COE program for the past five years. We also ask for your continued support for even greater advances in the future.

From here on, while making maximal use of the human development strategy and research capital created by this 21st Century COE Program, we seek to create the academic field of "stem cell medicine," a concept that embraces even wider academic boundaries. The Global COE Program "Education and Research Center for Stem Cell Medicine," selected in FY 2008, will push forward the formation of a research center that will serve as the nucleus of an international stem cell research network, as well as foster researchers and physicians in this field.



COE International Symposium (November 2007)

## 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/>

The 21st COE Program "Progress in Mathematics Motivated by Natural and Social Phenomena" ended in FY2007. During the five years of the program, we sought to create new, unique fields of study in mathematics with "noncommutativity" and "data science." Through our research activities, we are proud that we have created an internationally-recognized research and education center in mathematics. Our activities have also led Keio University to grant charter to the Center for Integrative Mathematics. We aim to further develop the center as a place where we can continue to carry out the fostering of Keio researchers in math and the integration of different fields to educate a new generation of researchers and serve as a hub for international collaboration.

This COE program especially placed heavy emphasis on international research and education, and we created overseas bases. In FY2007, we invited over 80 prominent overseas researchers for the "Pathway Lecture Series in Mathematics." We also were active in guidance of students and in joint research. With the University of Warwick in England as our central partner, we carried out the UK-Japan Winter School, a UK-Japan mutual education program for young researchers, in January 2008 at the University of Warwick, with the theme "Algebra and Symplectic Geometry."

This 21st Century COE Program advanced numerous international collaborations. For comprehensive research and education partnerships in mathematical science, we worked with universities including the University of Warwick, École Polytechnique, Boston University, the University of California at Berkeley, Yale University, and Yonsei University. With Yonsei University, we invited students and faculty and held an exchange workshop. We plan to continue this activity regularly in the future.

For international partnerships by different fields of research, we worked with

universities including École Polytechnique Fédérale de Lausanne, the Katholieke Universiteit Leuven, The Free University of Brussels, Centre International d'Etudes Françaises, McGill University, the Australian National University, the Korean Advanced Institute of Science and Technology, and Fudan University. We have started several academic networks on noncommutativity, mainly with institutes in Asia and Australia. Furthermore, we are currently planning to expand to several international research networks. To emphasize the international training of the next generation of young researchers, we have made ties with the Romanian Academy, the Vietnam Academe of Science & Technology, and Universidad de Los Andes. Our program invites outstanding students in these regions to the COE program and educates them to become researchers. Among the invited young researchers, a great number return to their countries and obtain research positions. Also, the COE program has accepted numerous foreign young researchers from overseas research promotion organizations and summer programs. These researchers have become repeat visitors, and visit the center regularly. The center has also sponsored many international conferences. Examples include the Noncommutative Geometry and Physics workshop and the Tsunami Symposium and Cherry Bud Workshop, focused on natural phenomena. Proceedings of these conferences were published by World Scientific Publishing. Every year, we have a mutual exchange with three faculty members from Osaka University. We are creating ties in mathematical research and education to open doors between Osaka area and Tokyo area.



Pathways Lecture by Professor Terng

## System Design: Paradigm Shift from Intelligence to Life

\* Replaced the late Professor Kazuo Yoshida, Graduate School of Science and Technology

Program Leader: Professor Takashi Maeno, Graduate School of Science and Technology  
<http://www.coesys.keio.ac.jp/English/index.html>

Fiscal 2007 was the last year of the 21st Century COE Program. We focused on well-defined topics in system life research while promoting close collaboration among COE members and actively pursuing exchange with research institutes overseas. We have also held discussions that publicized and summarized the concepts of this center. These efforts have led to the following achievements:

First, the Shift to Life Architectural Design Group, which elucidates shift to life design methods as well as transmits findings in an easy-to-understand manner, has established system life architectural and design methods and published summaries in clear Japanese and English. The publication in English is entitled "*System Design: Paradigm Shift from Intelligence to Life*" (Corona Publishing Co., Ltd., March 2008).

Two groups created to realize concrete product innovations were able to achieve results in shift to life research. For human-scale product innovations, we established basic technologies in shift to life by focusing on guide robots. Specifically, we were able to accomplish results in methods of hierarchical movement control methods for autonomously mobile robots that take into account movements on a time scale, in working out methods for incorporating notices when robots and humans communicate, and developing cooperating mechanisms between subordinate and superior control systems based on tactile perception. For micro-scale product innovations, we developed robust indoor environmental control methods using embedded learning functions, robust functional inspection of architectural designs using passive/active integrated environmental adjustment methods, and feature analysis of architectural design based on multi-space design models. With these innovations, we were able to suggest environmentally-robust life-design architectural systems as products.

For human resource programs to nurture young researchers, we implemented employment programs for research assistants and postdoctoral researchers, as well as an international internship program. This year, 22 RAs and 4 PDs were selected in the

spring semester, and 23 RAs and 5 PDs in the fall semester.

For the international internship program, we dispatched one RA to the Hong Kong Polytechnic University (China) for a long-term internship, and four RAs to Xi'an Jiaotong University (China), the University of Nebraska-Lincoln (U.S.), APUR-Atelier Parisien d'Urbanisme (France), and the University of Trento (Italy) for short-term internships. These internships contributed to the furthering of academic exchange.

Furthermore, the Leading-edge Design School carried out a variety of programs, including internship exchange with overseas lecturers. These programs deepened discussion among professors and showed commitment to the education of RAs and PDs. For each of the following three courses, Product & System Design, Architecture System Design, and Space System Design, the lecture-based "Design Intensive class" and the practicum-based "Design Project" class were held. As a result, we produced a great number of students who understood the important of biologically-inspired design techniques. Please note that the outstanding group education techniques fostered by and international lectures held by this Leading-edge Design School were transferred to the newly established Graduate School of System Design And Management in FY2008.

The 21st COE center also invited professor Deo Prasad (University of New South Wales) and professor Kosuke Ishii (Stanford University) for the international System Life symposium to actively carry out international collaboration and mutual understanding.

From the above activities and achievements, we brought to fruition the vision of the late Dr. Kazuo Yoshida, who conceived this COE program, for the COE center to be a global research center. Building on this center's achievements, we seek to further deepen the fostering of young researchers at a top, international level with the Global COE Program "Center for Education and Research of Symbiotic, Safe and Secure System Design," inaugurated in FY2008.

# Research Funds at Keio University in FY2007

Research funds at Keio University from national and local public institutions, private businesses, and university funding totaled approximately ¥16.4 billion in FY 2007.

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, 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.

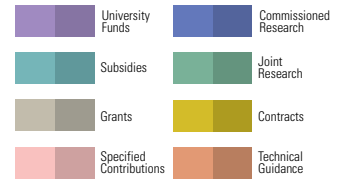
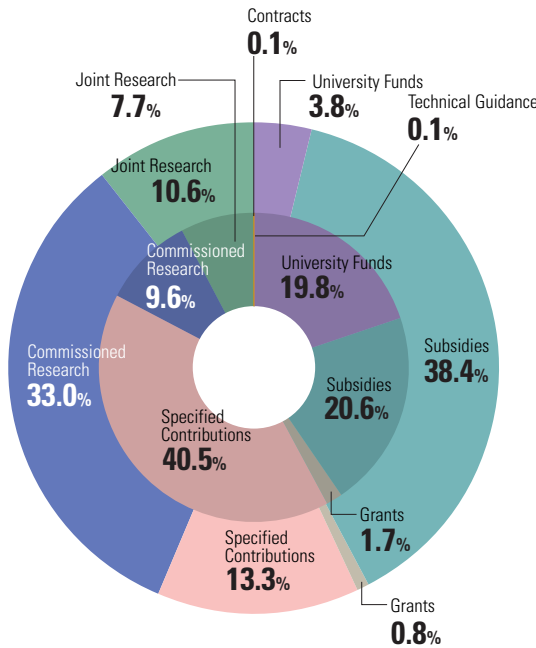
University funds represent less than 4% of the total at 630 million yen. Research funds from external entities represent nearly 96% of the total at 15.8 billion yen.

\*The total for university funds includes a contribution from the Current Expense Subsidies for Private Universities.

- Special expenses for graduate school education and advanced graduate school support menu group
- Improvement project for high technology research center
- Science frontier program
- Community collaboration program
- Improvement project for open research center

Type of Funds	Number of Projects	Amount
University Funds	782	630,666
Subsidies	811	6,317,761
Grants	66	134,381
Specified Contributions	1,598	2,194,895
Commissioned Research	379	5,424,980
Joint Research	302	1,742,299
Contracts	2	1,995
Technical Guidance	2	1,300
<b>Total</b>	<b>3,942</b>	<b>16,448,277</b>

**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.

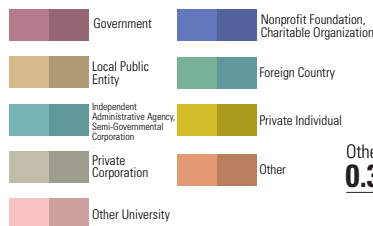
**Technical Guidance:** Research involving technical guidance such as development of equipment or apparatus.

## 2. Type of External Entity Contributing Research Funds

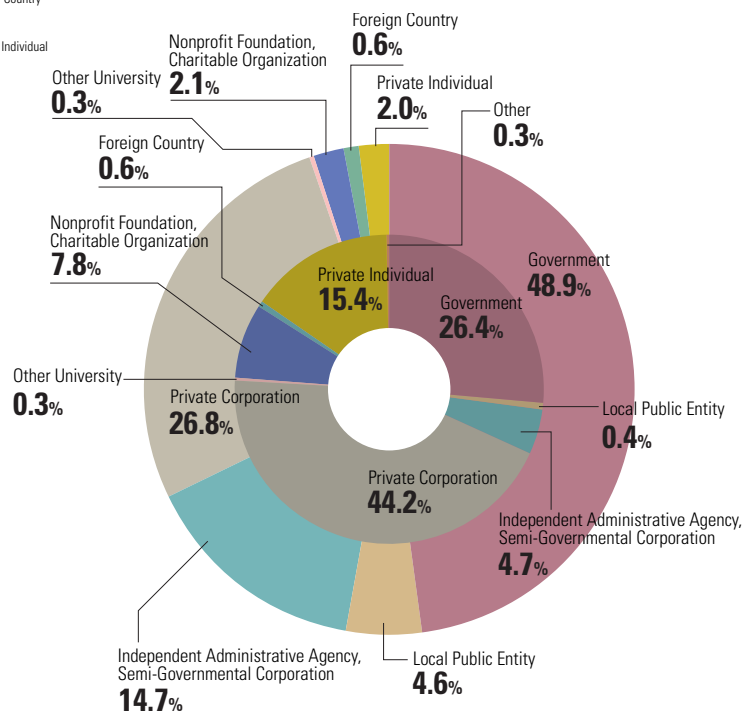
This category classifies funds by the type of external entity making the contribution. Private corporation account for the largest number of projects while the government account for the largest amount in yen.

\*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
Government	833	7,726,993
Local Public Entity	12	722,102
Independent Administrative Agency, Semi-Governmental Corporation	148	2,323,479
Private Corporation	1,398	4,240,307
Other University	8	51,685
Nonprofit Foundation, Charitable Organization	246	328,753
Foreign Country	18	98,677
Private Individual	486	318,957
Other	11	6,658
<b>Total</b>	<b>3,160</b>	<b>15,817,611</b>



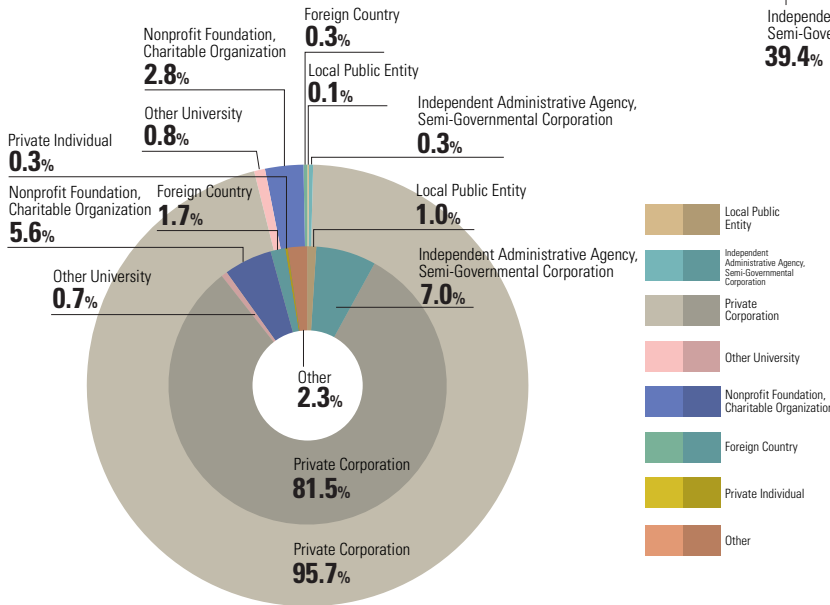
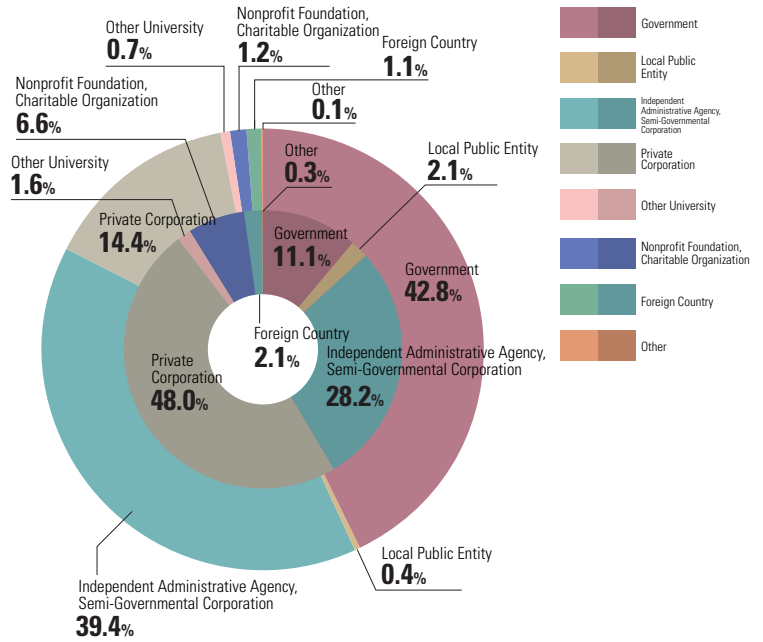
**Contribution Share by External Entity Type**  
(Amount (outer ring), Number of Projects (inner ring))



### Commissioned Research Expenses by External Entity Type

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

Type of External Entity	Number of Projects	Amount
Government	42	2,319,230
Local Public Entity	8	20,065
Independent Administrative Agency, Semi-Governmental Corporation	107	2,135,934
Private Corporation	182	779,750
Other University	6	38,378
Nonprofit Foundation, Charitable Organization	25	66,942
Foreign Country	8	59,681
Other	1	5,000
<b>Total</b>	<b>379</b>	<b>5,424,980</b>



### Joint Research Expenses by External Entity Type

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

Type of External Entity	Number of Projects	Amount
Local Public Entity	3	2,037
Independent Administrative Agency, Semi-Governmental Corporation	21	4,742
Private Corporation	246	1,666,876
Other University	2	13,307
Nonprofit Foundation, Charitable Organization	17	49,442
Foreign Country	5	5,202
Private Individual	1	0
Other	7	693
<b>Total</b>	<b>302</b>	<b>1,742,299</b>

## 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).

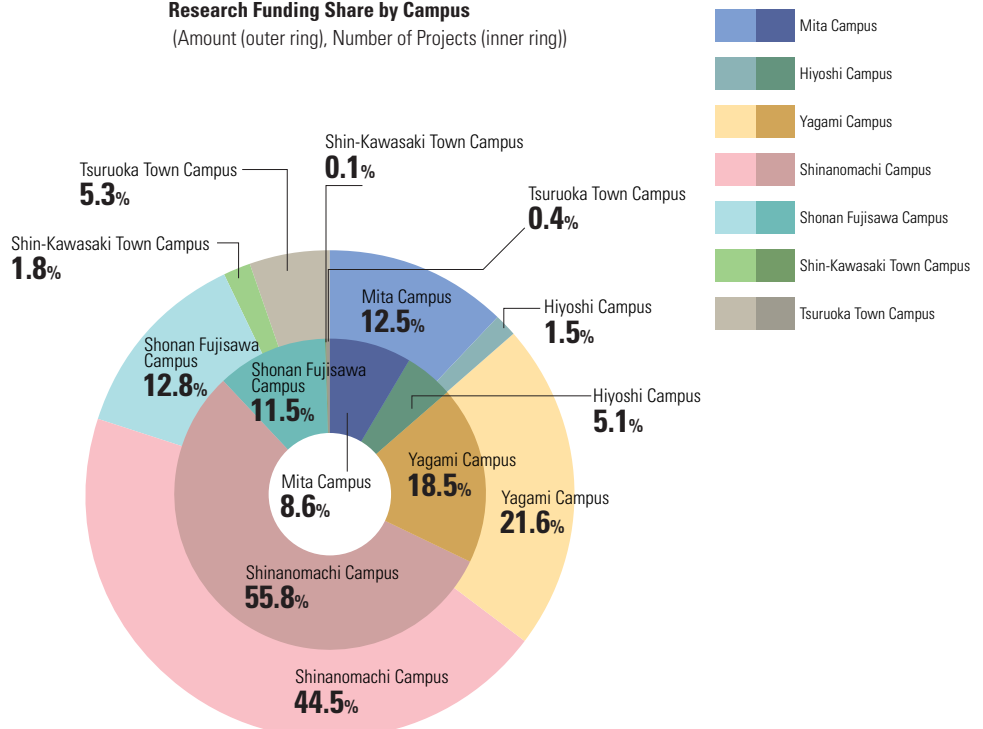
\*The totals are compiled based on the home campus (in principle, the affiliation of the research project representative). However, the actual research may take place at a different campus.

\*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	Amount
Mita Campus	339	2,057,483
Hiyoshi Campus	203	250,739
Yagami Campus	730	3,555,897
Shinanomachi Campus	2,200	7,325,872
Shonan Fujisawa Campus	453	2,100,044
Shin-Kawasaki Town Campus	3	292,722
Tsuruoka Town Campus	14	865,520
<b>Total</b>	<b>3,942</b>	<b>16,448,277</b>

### Research Funding Share by Campus

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

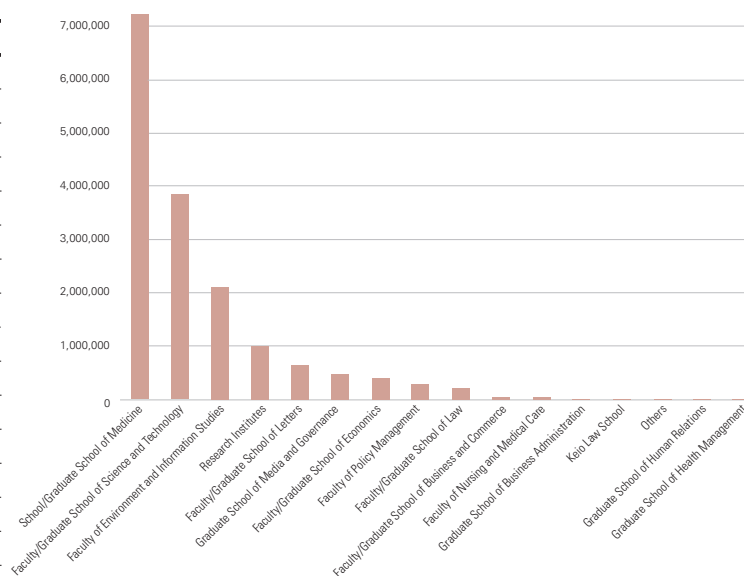


## 4. Research Funds by Affiliation of Researchers

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	Amount Thousand yen
Faculty/Graduate School of Letters	140	647,006
Faculty/Graduate School of Economics	121	395,472
Faculty/Graduate School of Law	79	217,114
Faculty/Graduate School of Business and Commerce	71	62,572
School/Graduate School of Medicine	2,184	7,219,346
Faculty/Graduate School of Science and Technology	739	3,852,220
Faculty of Policy Management	152	302,129
Faculty of Environment and Information Studies	227	2,117,792
Faculty of Nursing and Medical Care	33	56,897
Graduate School of Human Relations	3	6,050
Graduate School of Business Administration	20	28,306
Graduate School of Media and Governance	56	489,645
Keio Law School	32	23,787
Graduate School of Health Management	3	3,100
Research Institutes	70	1,015,558
Others	12	11,283
<b>Total</b>	<b>3,942</b>	<b>16,448,277</b>

Research Funds by Researcher Affiliation (in order of amount)

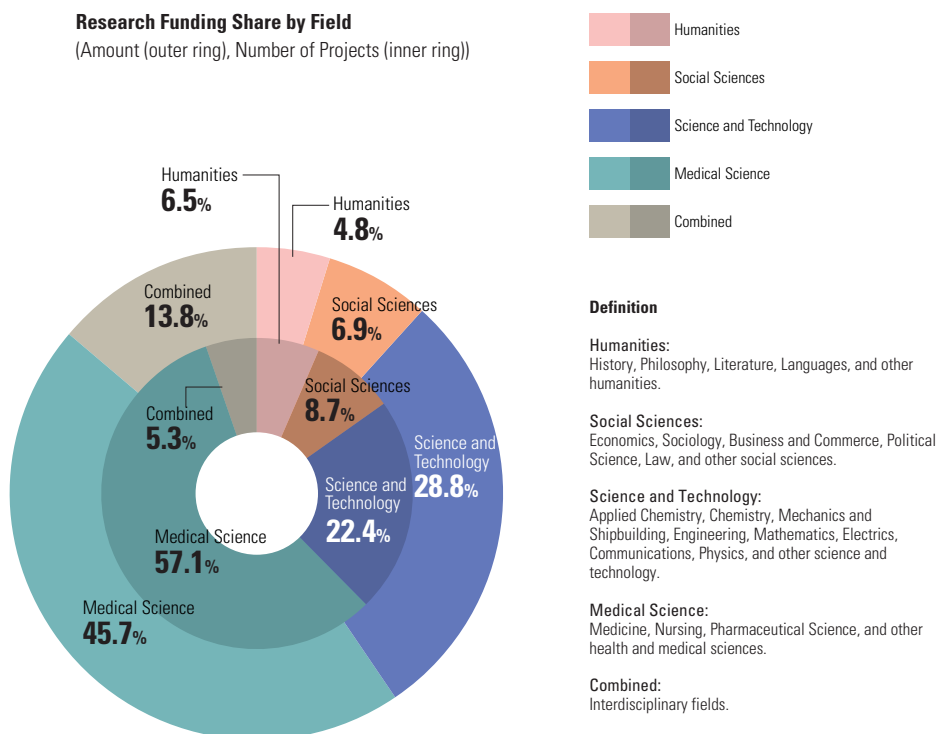


## 5. Research Funds by Field

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 (Ministry of Internal Affairs and Communications) Survey of Research and Development and research expense surveys by the Japan Association of Private Colleges and Universities.

Research Field	Number of Projects	Amount Thousand yen
Humanities	256	788,710
Social Sciences	343	1,128,048
Science and Technology	882	4,743,658
Medical Science	2,252	7,520,632
Combined	209	2,267,229
<b>Total</b>	<b>3,942</b>	<b>16,448,277</b>

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

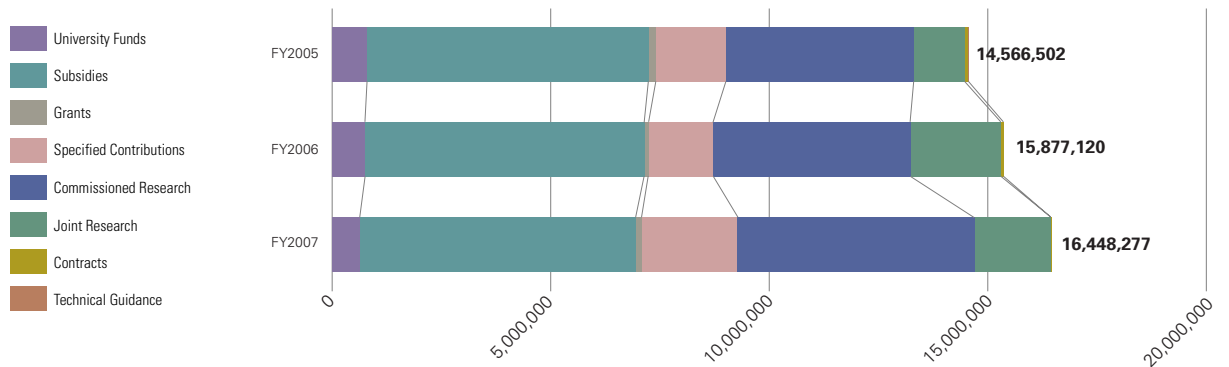


## 6. Research Fund Data over the Past 3 Years

The table shows that research funding over the past three years (FY 2005 to FY 2007) has been increasing. Looking at research funds by type reveals a sharp increase in commissioned research projects.

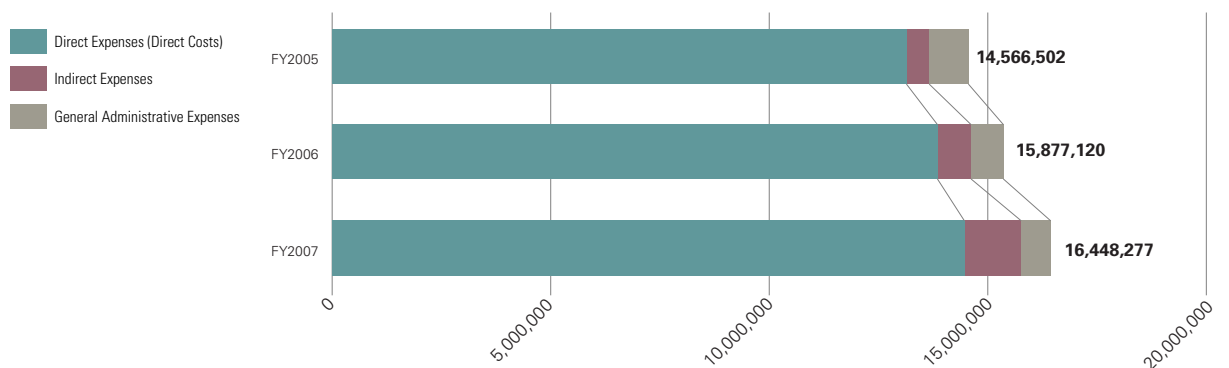
Research Funds by Type over the Past 3 Years

Type of Research Funds	FY 2005	FY 2006	FY 2007
University Funds	798,164	749,592	630,666
Subsidies	6,436,472	6,387,754	6,317,761
Grants	171,421	104,794	134,381
Specified Contributions	1,604,521	2,063,242	2,194,895
Commissioned Research	4,296,684	4,438,734	5,424,980
Joint Research	1,163,996	2,073,601	1,742,299
Contracts	88,499	59,403	1,995
Technical Guidance	6,745	0	1,300
<b>Total</b>	<b>14,566,502</b>	<b>15,877,120</b>	<b>16,448,277</b>



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

Type of Research Funds	FY 2005	FY 2006	FY 2007
Direct Expenses (Direct Costs)	13,137,388	14,142,780	14,467,728
Indirect Expenses	529,791	781,735	1,305,746
General Administrative Expenses	899,323	952,605	674,803
<b>Total</b>	<b>14,566,502</b>	<b>15,877,120</b>	<b>16,448,277</b>



# Competitive Research Funds

In FY 2007, eight government ministries and 37 systems distributed 476.6 billion Japanese yen as competitive research funds from the science and technology budget. This represented 13.6% of the total science and technology budget. The government's budget for science and technology is increasing. The 3rd Science and Technology Basic Plan (FY 2006 to FY 2010) specifies that strategic funds will be given to organizations aiming to become world-class research centers under the principle of competition. Under this policy, competition for research funds among universities is growing more intense every year.

One common source of competitive research funds is the MEXT Grants-in-Aid for Scientific Research (*Kakenhi*). The budget for FY 2007 was 191.3 billion yen (increase of 1.8 billion / 0.9% from the previous year). Other sources of funds are the Basic Research Programs (Japan Science and Technology Agency (JST)), the Health and Labour Sciences Research Grants (Ministry of Health, Labour and Welfare), and the Special Coordination Fund for the Promotion of Science and Technology (Ministry of Education, Culture, Sports, Science and Technology (MEXT) and JST).

Below is a summary of these three competitive research funds of MEXT (the Grants-in-Aid for Scientific Research, the Basic Research Programs, and the Special Coordination Fund for the Promotion of Science and Technology) and a partial look at Keio University's achievements in receiving funds.

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* ranges from humanities and social sciences to the natural sciences. Grant money is given to various types of scientific research from basic to applied-based on the free-thinking of researchers-to stimulate remarkable advances. After undergoing peer review, the researcher receives grant money to conduct research on his original, path-breaking area of study. These funds accommodate a great variety of projects from budding to path-breaking. Over the years, the research achievements based on this grant money have received world-wide recognition and commendations including as Nobel prizes. *Kakenhi* represents approximately 5% of the government's total expenses related to science and technology and 40% of the government's total budget for competitive research funds.

The number of applications submitted in FY 2007 was 121,219 (1,213 less than FY 2006). From this total, 49,425 proposals qualified for research funding (1,942 more than FY 2006). The table shows the number of projects of the top 20 institutions receiving grant money from FY 2005 to FY 2007 (new and those continuing from the previous year) and the total amount distributed.

The amount received by the top 10 institutions represents 48% of the total amount distributed. Keio University ranks 13th overall and 1st among private institutions.

### *Kakenhi* Distributed by Institution

Rank	FY2005			FY2006			FY2007		
	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	2,812	20,111	University of Tokyo	2,860	19,970	University of Tokyo	2,906	21,222
2	Kyoto University	2,203	13,115	Kyoto University	2,310	12,874	Kyoto University	2,366	14,281
3	Tohoku University	1,703	9,479	Tohoku University	1,890	10,071	Osaka University	1,931	10,526
4	Osaka University	1,657	8,929	Osaka University	1,794	8,722	Tohoku University	2,007	10,411
5	Nagoya University	1,232	6,455	Nagoya University	1,256	6,770	Nagoya University	1,318	6,633
6	Kyushu University	1,365	5,683	Kyushu University	1,466	6,008	Kyushu University	1,494	6,129
7	Hokkaido University	1,318	5,614	Hokkaido University	1,456	5,998	Hokkaido University	1,436	6,054
8	Tokyo Institute of Technology	775	4,544	Tokyo Institute of Technology	790	4,650	Tokyo Institute of Technology	787	5,064
9	University of Tsukuba	857	3,020	University of Tsukuba	944	3,129	University of Tsukuba	972	3,423
10	RIKEN	487	2,627	Kobe University	762	2,619	RIKEN	602	3,276
11	Keio University	589	2,486	RIKEN	553	2,592	Kobe University	759	2,942
12	Kobe University	737	2,473	Hiroshima University	837	2,468	Hiroshima University	857	2,727
13	Hiroshima University	842	2,318	Keio University	622	2,198	Keio University	669	2,387
14	Okayama University	603	1,826	Waseda University	576	1,848	Waseda University	569	1,951
15	Chiba University	575	1,787	Tokyo Medical and Dental University	407	1,811	Tokyo Medical and Dental University	425	1,947
16	Waseda University	509	1,780	Okayama University	644	1,807	Okayama University	625	1,944
17	Tokyo Medical and Dental University	375	1,769	Chiba University	593	1,629	Chiba University	593	1,896
18	Kumamoto University	392	1,455	Kanazawa University	501	1,349	Kanazawa University	554	1,498
19	Kanazawa University	453	1,357	Kumamoto University	408	1,301	Kumamoto University	432	1,399
20	Osaka City University	335	1,236	Niigata University	458	1,136	Nagasaki University	404	1,195
A			162,454			164,720			182,318
B			79,577			80,811			87,019
B/A			49%			42%			48%
C			98,064			98,950			106,903
C/A			60%			52%			59%

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/>

\* The distribution amount includes direct and indirect expenses.

\* Figures of 100,000 yen and below are rounded off.

\* Data here is classified by the research institution with which the research representative is affiliated; it may not reflect the overall ranking by institution.



## 2 Basic Research Programs

Based on creating new technologies and meeting the needs of society, the economy, and Japan's science and technology policy, Basic Research Programs promote fundamental target-oriented studies for the achievement of strategic objectives designated by the government. Specific areas of research have been established by the Japan Science and Technology Agency (JST) based on the strategic objectives of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The JST issues calls for research proposals in these areas and nominates the most appropriate researchers to undertake the work.

The program promotes open-type research and supervised-type research.

In the open type, based on a set area of research, a research director selects individuals to work on a theme through a call for proposals. Open research has two types:

CREST (Core Research for Evolutional Science and Technology) in which a team is formed and PRESTO (Precursory Research for Embryonic Science and Technology) in which individuals conduct path-breaking research.

In the supervised type (also called Exploratory Research for Advanced Technology or ERATO), researchers are brought together to advance research based on researcher targets from the unique perspective of directors. This type includes joint research with overseas research organizations.

\*Japan Science and Technology Agency (JST): From the Basic Research Programs website <http://www.jst.go.jp/kisoken/>

\*The list below shows research themes from FY 2007.

\*Solution-Oriented Research for Science and Technology (SORST) refers to the continuation of a project that has completed its initial period of examination under the Basic Research Programs. The project is continued because it has great potential for future benefits.

### CREST Research Representatives

Affiliation	Position	Name	Research Theme
School of Medicine	Professor	Shigeo Koyasu	Infectious Disease Control by Understanding the Strategy of Pathogenic Microbes Affecting Host Immune System
Faculty of Science and Technology	Professor	Tadahiro Kuroda	Generation of High-performance, Ultra-low-power, Short-range Wireless Mobile Information System
Faculty of Science and Technology	Professor	Hideo Saito	Technology to Display 3D Contents into Free Space
Faculty of Science and Technology	Professor	Koji Suzuki	Creation of "Nanochemical Probes" and their Biomedical Sensing Application
Faculty of Science and Technology	Professor	Atsushi Nakajima	Nano-scale Designed Surface Orientated Towards Novel Optomagneto materials
Faculty of Science and Technology	Professor	Kimihiya Yamamoto	Nano-catalyst Based on Fine-controlled Metal Assembling
Faculty of Environment and Information Studies	Professor	Masahiko Inakage	The Research of Ubiquitous Content Production Authoring System
Faculty of Environment and Information Studies	Professor	Hideyuki Tokuda	A Dependable Operating System for Micro Ubiquitous Nodes
Faculty of Environment and Information Studies	Professor	Masaru Tomita	Development of Modeling/Simulation Environment for Systems Biology

### PRESTO Researchers

Affiliation	Position	Name	Research Theme
School of Medicine	Assistant Professor	Motoaki Sano	Metabolomic analysis of heart failure and cardiac senescence
School of Medicine	Assistant Professor	Takeshi Miyamoto	Regulation of bone metabolism through osteoclast cell-cell fusion
Faculty of Science and Technology	Assistant Professor	Eiji Saitoh	Spintronics based on spin currents and spin-photon coupling in dielectrics
Faculty of Science and Technology	Research Associate	Akinobu Yamaguchi	Study in novel electromagnetic properties of modulated and/or periodic magnetic structure composed of nanoscale magnets
Graduate School of Media and Governance	Associate Professor	Yasushi Ishihama	Development of ultramicro-electrospray ionization approaches for -omics research

### SORST Researchers

Affiliation	Position	Name	Research Theme
School of Medicine	Professor	Hideyuki Okano	Nerve Regeneration Strategy Based on Endogenous Neural Stem Cell Activation
Faculty of Science and Technology	Professor	Yasuhiro Koike	Photonics Polymers for Fiber To The Display

## 3 Special Coordination Fund for Promoting Science and Technology

The Special Coordination Fund for the Promotion of Science and Technology covers the main expenses necessary for the promotion of science and technology in line with the policy of the Council for Science and Technology Policy. Implementing the measures below achieves a high policy-induced effect over policy initiatives of each ministry, areas not covered by the policies of each ministry, areas that cannot be handled by the policy of each ministry, areas of expected synergies based on inter-organizational cooperation, and areas that require a flexible approach.

- (1) Systemic reform of science and technology to generate excellent results and to make good use of them
- (2) Strategic response in areas that have future potential
- (3) Promotion of science and technology on an international level

In particular, these programs include Promotion of Environmental Improvement for Independence of Young Researchers, Support Model for Development of Female Researchers, Creation of Innovation Centers for Advanced Interdisciplinary Research Areas, Human Resource Development System for the Revitalization of Regional

Industry and Society, Strategic Promotion of Science and Technology in Asia, Promotion of Versatile Responses to Important Policy Themes and Promotion of Effective and Efficient Group Policies on Cooperation in Science and Technology.

In FY 2007, Keio University applied to participate in the program for Creation of Innovation Centers for Advanced Interdisciplinary Research Areas. Out of 26 applications nationwide, Keio's proposal entitled "Creating a co-mobility Society" was selected as the only one from private universities among nine successful proposals.

Keio's proposal entitled "Development of Environmental Resources Management Technology for Sustainable Use of Biomass" was selected to participate in the "Strategic Promotion of Science and Technology in Asia" program. And the proposal entitled "Development of Systematic Assessment Methods based on Kampo Antioxidant Capacity for the Prevention of Arteriosclerosis and Brain Aging" was selected for the "Promotion of Versatile Response to Important Policy Themes" program.

### Research in Progress from 2007

Affiliation	Position	Research Representative	Program	Research Theme
Faculty of Science and Technology	Associate Professor	Kenji Kono	Promote Research Activities to Tackle Important Issues	Development of a Highly Secure, Next-Generation OS
Graduate School of Media and Governance	Professor	Hiroichi Yoshida	Promote Research Activities to Tackle Important Issues	Standardization of a Lithium-Ion Battery Cell for Power Storage
Research Institute for Digital Media and Content	President	Yuichiro Anzai	Encouraging development of Strategic Research Centers	Research Institute for Digital Media and Content, Keio University
School of Medicine	Professor	Sadakazu Aiso	Fostering talent in emergent research fields	Training Course for Technical Assistants on <i>in vivo</i> Medical Science

### New Subjects Selected in 2007

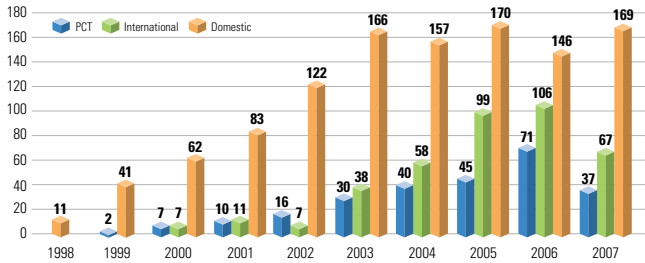
Affiliation	Position	Research Representative	Program	Research Theme
Faculty of Science and Technology, Faculty of Environment and Information Studies, Graduate School of Media and Governance, etc.	President	Yuichiro Anzai	Creating of Innovation Centers for Advanced Interdisciplinary Research	Creating a Co-mobility Society
Faculty of Environment and Information Studies	Professor	Masataka Watanabe	Strategic Promotion of Science and Technology in Asia	Development of Environmental Resources Management Technology for Sustainable Use of Biomass
School of Medicine	Associate Professor	Kenji Watanabe	Promotion of Versatile Responses to Important Policy Themes	Development of Systematic Assessment Methods based on Kampo Antioxidant Capacity for the Prevention of Arteriosclerosis and Brain Aging

# Intellectual Property and Technology Transfer

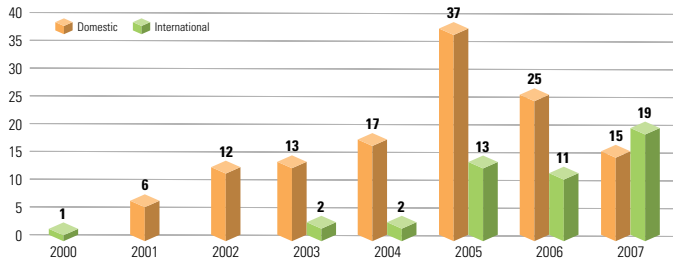
## 1 Intellectual Property

In FY 2007, the IPC continued to engage in vigorous patent application activity with 169 domestic patent applications, 37 PCT applications, and 67 overseas patent applications. The center also registered 15 domestic patents and 19 overseas patents.

Patent Applications



Registered Patents



Proportion of Applications by Field of Technology (2007)

Bio / Medical	39%
Information / Communication	33%
Control / Measurement	13%
Materials / Chemicals	16%

Number of Applications by Campus (2007)

Yagami (Faculty of Science and Technology) Campus	98
Shinamachi (School of Medicine) Campus	37
SFC	16
Mita Campus	8
Hiyoshi Campus	4
Outside of campus	6

Total Patent Applications by Inventor (2007)

Professors	83
Associate Professors	39
Senior Assistant Professors	18
Assistant Professor and Research Associate	14
Students and others	13
Employee	2

\*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.

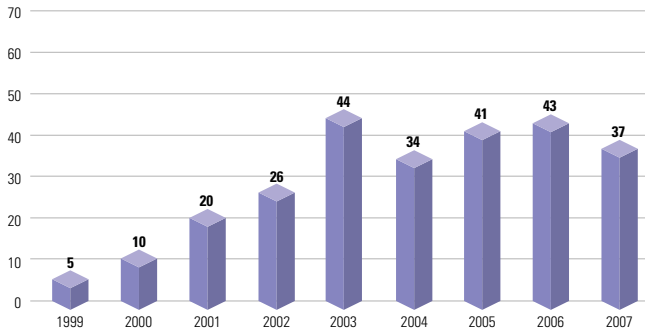
Technology transfers are conducted in the following three forms:

- (I) Licensing of Keio University's intellectual property to companies
- (II) Start UP venture companies based on Keio University's intellectual property
- (III) Creation of joint research companies based on Keio University's

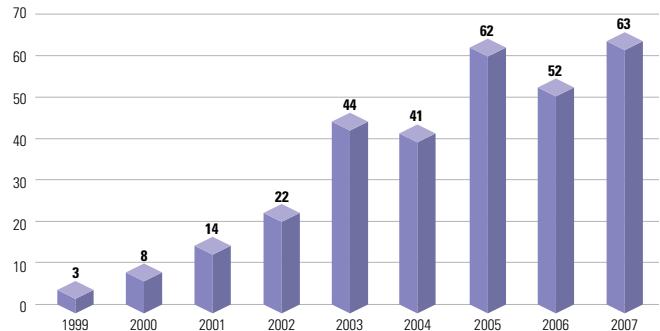
intellectual property, and continuation of development activities in that company

In FY 2007, the IPC made 37 new licensing agreements with companies. Total license income in 2007 from current and past agreements was 45.92 million yen. The aggregate total of license income since establishment is 390 million yen.

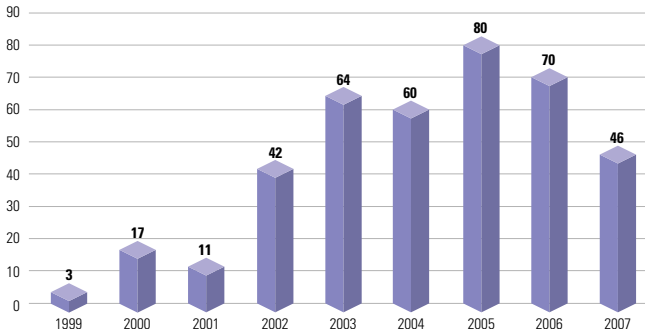
Number of New Licensing Agreements



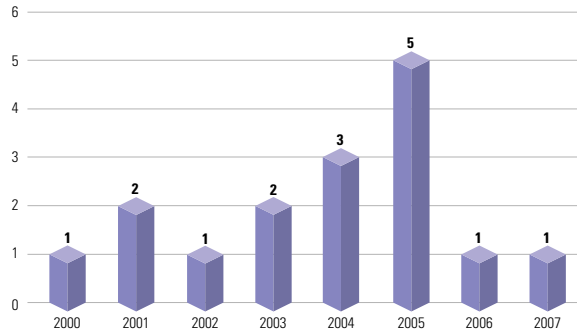
Income-Generating Licenses



Licensing Revenues



IP-Based Ventures (Start ups)



The IPC collaborates with the Keio University Incubation Center to support the establishment of venture businesses. In FY 2007, one company established based on Keio IP was launched: SPIBER, Inc. Thus far a total of 16 companies have been established, with Keio University holding an equity stake in 12 of them.

# Research-related Facilities and Libraries

## Research Space for Rent

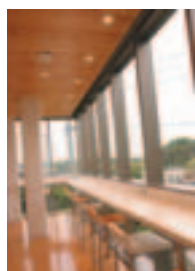
Keio University provides research space and incubation facilities for rent as indicated below. Policies and availability differ by campus, so please inquire in advance for vacancies, rental qualifications, application procedures, application deadlines, etc.

As of July 2008



Sousoukan Building on Yagami Campus

Facility	Outline	For Inquiries
Research Space at the KLL (See pages 19-20)	Total of 32 rooms in <i>Sousoukan</i> Building on Yagami Campus Size: 66.12m <sup>2</sup> - 102.49m <sup>2</sup> ; Total floor area: 2,519m <sup>2</sup> 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. +81-45-566-1794 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/
Shin-Kawasaki Town Campus (See pages 25-26)	Four research buildings (two floors each) 5,336.11m <sup>2</sup> (total floor area)	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 21-22)	56 units in the Institute of Integrated Medical Research Building Steel frame with a reinforced concrete structure; 2 under ground floors, 9 above ground floors, and one penthouse floor Total floor area: 24,400m <sup>2</sup>	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/
Keio Fujisawa Innovation Village (SFC-IV) (See page 24)	Steel frame structure, 2 floors Site area: 1,825.3m <sup>2</sup> Total floor area: 1,470.0m <sup>2</sup> Rental space: 906.4m <sup>2</sup> 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 28)	29 units, Size: 7m x 10m x 2.8m Steel frame structure, 2 floors Total floor area: approximately 3,700m <sup>2</sup>	Planning and Coordinating Division, Department of General Affairs, Tsuruoka City Tel. +81-235-25-2111 (ext. 321) E-mail: kikaku@city.tsuruoka.yamagata.jp http://www.city.tsuruoka.yamagata.lg.jp/ (HP of Tsuruoka City)



Keio Fujisawa Innovation Village

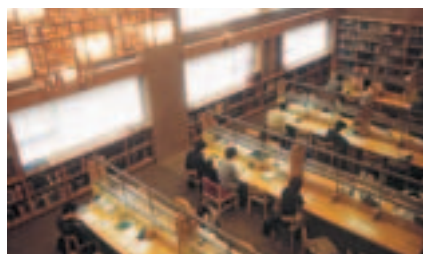
## Library Collections

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, 2008

	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	2,618,545	938,065	1,021,443	241,658	286,420	130,959	1,342
Hiyoshi Media Center	784,155	427,144	210,904	48,710	63,497	33,900	1,365
Shinanomachi Media Center	396,328	67,423	50,486	88,236	183,936	6,247	216
Information and Media Center for Science and Technology	357,883	91,535	43,716	55,945	163,050	3,637	458
Shonan Fujisawa Media Center	399,845	213,964	90,289	44,789	25,086	25,717	1,080
<b>Total</b>	<b>4,556,756</b>	<b>1,738,131</b>	<b>1,416,838</b>	<b>479,338</b>	<b>721,989</b>	<b>200,460</b>	<b>4,461</b>

\* There are also more digital media materials (No. of titles: Database - 301, Electronic journal - 29,055, Electronic books - 5,968).



New University Library at Mita Media Center



Hiyoshi Media Center



Shinanomachi Media Center

# Researchers at Keio University in FY2007

This section presents data from FY 2007 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. The number of the non-tenured researchers (that is, the total number of researchers with fixed period contracts and special research professors) accounts for 26% overall, but is a striking 51% at Shonan Fujisawa Campus.

Campus	Number of people			
	Tenured Researchers	Researchers with Fixed Period Contract	Special Research Professors	Total
Mita	371	35	62	468
Hiyoshi	288	22	4	314
Yagami	239	20	39	298
Shinanomachi	495	6	211	712
Shonan Fujisawa	134	44	98	276
<b>Total</b>	<b>1,527</b>	<b>127</b>	<b>414</b>	<b>2,068</b>

As of 1 May 2007

## 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
<b>Course Doctorate</b>	
Graduate School of Letters	7
Graduate School of Economics	3
Graduate School of Law	6
Graduate School of Human Relations	0
Graduate School of Business and Commerce	1
Graduate School of Medicine	31
Graduate School of Science and Technology	84
Graduate School of Business Administration	1
Graduate School of Media and Governance	31
<b>Subtotal</b>	<b>164</b>
<b>Dissertation Doctorate</b>	
Graduate School of Letters	4
Graduate School of Economics	2
Graduate School of Law	3
Graduate School of Human Relations	0
Graduate School of Business and Commerce	2
Graduate School of Medicine	56
Graduate School of Science and Technology	14
Graduate School of Business Administration	0
Graduate School of Media and Governance	2
<b>Subtotal</b>	<b>83</b>
<b>Total</b>	<b>247</b>

As of 31 March 2008

### Number of Students Registered in Doctoral Courses

		Number of people
Graduate School of Letters	< 45 >	128
Graduate School of Economics	< 15 >	54
Graduate School of Law	< 30 >	92
Graduate School of Human Relations	< 11 >	54
Graduate School of Business and Commerce	< 20 >	49
Graduate School of Medicine *	< 68 >	202
Graduate School of Science and Technology	< 150 >	338
Graduate School of Business Administration	< 8 >	12
Graduate School of Media and Governance	< 50 >	172
Graduate School of Health Management	< 10 >	8
<b>Total</b>		<b>1,109</b>

As of 1 May 2007

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)	46	Researchers participating in research without a contract of commissioned research.	
Researchers of Keio Leading-edge Laboratory of Science and Technology (KLL) (Yagami)	99	Researchers participating in research under a commissioned research contract.	
School of Medicine Researcher (Shinanomachi)	267	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)	275	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)	113	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)	332		
Others (See Table B)	1,204		
<b>Total</b>	<b>2,336</b>		

**Table A: Visiting Professors and Researchers**

Job Title, Status	Mita/Hiyoshi	Yagami	Shinanomachi	Shonan Fujisawa	Total	Number of people
Visiting Professor	33	36	14	1	84	
Visiting Associate Professor	8	10	17	0	35	
Visiting Lecture	3	4	7	0	14	
Visiting Instructor	1	2	0	0	3	
Visiting Research Fellow	43	53	70	2	168	
Visiting Junior Research Fellow	18	7	3	0	28	
<b>Total</b>	<b>106</b>	<b>112</b>	<b>111</b>	<b>3</b>	<b>332</b>	

**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)	28	38	66	
Institute for Media and Communications Research (Mita)	9	52	61	
Keio Economic Observatory (Mita)	32	38	70	
Shido Bunko, Institute of Oriental Classics (Mita)	10	2	12	
International Center (Mita)	64	31	95	
Teacher Training Center (Mita)	47	47	94	
Fukuzawa Memorial Center for Modern Japanese Studies (Mita)	25	39	64	
Institute of East Asian Studies (Mita)	25	37	62	
Center for Japanese Studies (Mita)	19	37	56	
Research Center for the Arts and Arts Administration (Mita)	20	14	34	
Global Security Research Institute (G-SEC) (Mita)	50	30	80	
Research Institute for Digital Media and Content (DMC) (Mita)	94	37	131	
Institute of Physical Education (Hiyoshi)	19	36	55	
Health Center (Hiyoshi)	15	0	15	
Keio Research Center for Foreign Language Education (Hiyoshi)	56	12	68	
Sports Medicine Research Center (Hiyoshi)	8	11	19	
Keio Research Center for the Liberal Arts (Hiyoshi)	195	27	222	
<b>Total</b>	<b>716</b>	<b>488</b>	<b>1,204</b>	

Figures show the totals for FY2007. Place names in parentheses indicate location of the institution.

\*1 Generic designation used for visiting professor, visiting associate professor, visiting lecture, visiting instructor, visiting research fellow and visiting junior research fellow. (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.

# FY2007 Financial Position

Ended on March 31, 2008

## 1 Balance Sheet

		Million yen	
<b>Assets</b>			
<b>Fixed assets</b>		<b>297,603</b>	
Tangible fixed assets		187,939	
Land		27,508	
Buildings		86,030	
Structures		4,344	
Equipment and supplies for education and research		21,959	
Other equipment and supplies		406	
Books		37,642	
Vehicles		22	
Construction in progress		10,028	
Other fixed assets		109,663	
Land lease rights		40	
Telephone subscription rights		72	
Facility use rights		155	
Deposits		551	
Profit-making business capital		3,750	
Long-term loans		1,886	
Specified assets *1		59,823	
School bond assets producing interest		5,306	
Reserve assets for the third fund		38,080	
<b>Current assets</b>		<b>60,309</b>	
Cash deposits		24,509	
Accounts receivable		12,472	
Inventories		424	
Negotiable securities		21,737	
Assets for school trip deposits		100	
Others		1,067	
<b>Assets total</b>		<b>357,912</b>	
<b>Liabilities</b>			
<b>Fixed liabilities</b>		<b>58,615</b>	
Long-term borrowings		8,168	
School bonds		3,673	
Retirement allowance reserve		28,578	
Pension reserve		18,196	
<b>Current liabilities</b>		<b>31,449</b>	
Short-term borrowings *2		2,506	
School bonds *2		1,633	
Accounts payable		12,085	
Advances received		12,989	
Deposits		2,136	
School trip deposits		100	
<b>Liabilities total</b>		<b>90,064</b>	
<b>Funds</b>			
Funds			
First fund *3		285,307	
Second fund *4		13,049	
Third fund *5		38,080	
Fourth fund *6		8,730	
<b>Funds total</b>		<b>345,166</b>	
<b>Balance of income and expenditure</b>			
Carried forward to next year		77,318	
<b>Total of liabilities, funds, and balance of income and expenditure</b>		<b>357,912</b>	



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 FY2008.

\*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 (2.85 billion yen transferred in FY2007)

\*5 Third Fund

Amount of assets related to scholarships and research funds.

\*6 Fourth fund

Required working capital (In accordance with accounting standards, 100 million yen transferred in FY 2007.)

Source: *Activities and Financial Position of Keio Gijuku: FY2007 Business Report*

## 2 Income and Expenditure Statement

			Million yen		
<b>Income</b>	All of Keio (Keio Gijuku)	University only	<b>Expenditure</b>	All of Keio (Keio Gijuku)	University only
<b>Imputed income</b>			<b>Personnel</b>	<b>63,938</b>	<b>33,607</b>
Tuition and other student fees	44,316	36,613	Expenses for education and research*3	55,096	28,488
Other fees	2,395	2,084	Expenses for general administration	3,970	1,171
Donations*1	10,500	3,433	Interest on borrowings	250	126
Subsidies*2	12,852	10,173	Loss on disposition*4	5,456	483
Income from asset management	5,734	174	Provision for allowance for doubtful accounts	35	0
Asset sales differential	98	0	Discretionary reserve	-	-
Income from business	8,211	7,778	<b>Total expenditure</b>	<b>128,744</b>	<b>63,877</b>
Income from medical services	43,080	0	Current excess over expenditure	8,579	-
Miscellaneous income	3,620	3,257	Brought forward from last year	68,739	-
<b>Imputed income total</b>	<b>130,806</b>	<b>63,514</b>	Carried forward to next year	77,318	-
Transfer to capital fund	△ 10,641	△ 5,527	<b>Imputed income total -</b>		
<b>Income total</b>	<b>120,165</b>	<b>57,986</b>	<b>Total expenditure</b>	<b>2,062</b>	<b>△ 363</b>

\*1 Donations

Includes contributions in goods.

\*2 Subsidies

In FY2007, subsidies from the Promotion and Mutual Aid Corporation for Private Schools in Japan (PMAC) totaled ¥8,733,790,000. General subsidies account for ¥6,189,888,000 of this amount and special subsidies account for ¥2,543,902,000. 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

Approximately 4.5 billion yen is based on the valuation of financial assets. The value show the latent worth profit and loss based on the valuation amount at the end of March.

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: FY2007 Business Report*

# Awards for Research Activities, FY2007

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

Date Awarded (YYYY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2007/04/06	Yuji Nagasaka (Professor, Faculty of Science and Technology) and others	Japan Society of Mechanical Engineers Medal for the Best Papers	Evaluation of the Thermophysical Properties of Functionally Graded Materials at High Temperatures by the Photothermal Radiometry, Trans. JSME, B70-695, 1849-1855, (2004)	Japan Society of Mechanical Engineers
2007/04/17	Kazunobu Sawamoto (Associate Professor (non-tenured), School of Medicine)	Commendation by Minister of Education, Culture, Sports, Science and Technology - Young Researcher in Science and Technology	For research on production, transfer, and regeneration of nerve cells	Ministry of Education, Culture, Sports, Science and Technology
2007/04/17	Masaru Tomita (Professor, Faculty of Environment and Information Studies, Director, Institute for Advanced Biosciences) Tomoyoshi Soga (Professor, Faculty of Environment and Information Studies, Institute for Advanced Biosciences)	Prizes for Science and Technology, Research Category, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology	The prize winners have developed a CE-MS technology, which enables simultaneous analysis of thousands of intracellular metabolites. This method has already been used to discover drug-induced hepatitis markers. The method is expected to lead to breakthroughs in the pharmaceutical sector.	Ministry of Education, Culture, Sports, Science and Technology
2007/04/18	Intellectual Property Center	Recognition of Intellectual Property Award/Commendation by Minister of Economy, Trade and Industry	Recognition for being an organization that utilizes and contributes to the smooth operation and expansion of the industrial property system.	Ministry of Economy, Trade and Industry / Japan Patent Office
2007/04/19	Tomoaki Ohtsuki (Associate Professor, Faculty of Science and Technology)	5th International Communications Foundation Research Award	Recognition for leading-edge and creative research that contributes to the diffusion and expansion of information communication through implementation of R&D on volume increase of Ultra-Wideband (UWB), which was awarded the Research Encouragement Prize by ICF in 2002	International Communication Foundation
2007/04/19	Yasuo Suga (Professor, Faculty of Science and Technology)	Achievement Award in Research of Welding	Award for the distinguished achievements in research of underwater welding, hyperbaric welding, monitoring of welding an intelligent control of welding process.	Japan Welding Society
2007/04/27	Yasuhiro Koike (Professor, Faculty of Science and Technology)	Honorary of Doctorate	The honorary doctorate is awarded for his pioneering work in the field of Photonics Polymer.	Eindhoven University of Technology
2007/05/15	Shuzo Murakami (Professor, Faculty of Science and Technology) Shinsuke Kato (Visiting Professor, Faculty of Science and Technology)	Award of the Society (Category in Academic Paper)	For the excellent papers of "Study on Evaluation of Ventilation Effectiveness of Occupied Zone in Office Space"	The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan
2007/05/16	Takamori Ukai (Research Associate (Non-tenured), Faculty of Science and Technology)	2006 CPLJ prize for Encouragement of thesis	For potential and expansibility about city planning of Ph. D thesis "A theory of activity distribution in a city based on graph structure of traffic network and interaction between points" submitted to Keio University	The City Planning Institute of Japan
2007/05/20	Sakurako Inoue (Assistant Professor, Faculty of Letters)	Society of the French Language and Literature Award	For work entitled "Saint-Lambert against Rousseau-the Function of the Reflections on the Theatre in The Seasons- ( Studies on the French Language and Literature, No. 88)"	Japan Society of the French Language and Literature
2007/05/30	Yoshiteru Aoyagi (Research Associate (Non-tenured), Faculty of Science and Technology)	JSMS Award for Best Presentation	For the presentation "Multiscale Crystal Plasticity Simulation on Ultrafine-Graining Based on Dislocation Pattern and Accumulation of GN Dislocation"	The Society of Materials Science, Japan
2007/06/06	Hideki Tsuge (Professor Emeritus)	The Society Award of the Society of Sea Water Science, Japan	Research on the reaction crystallization of the salts dissolved in the sea water	The Society of Sea Water Science, Japan
2007/06/24	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology) Yoshiki Ujije (Assistant Professor (Non-tenured), Faculty of Science and Technology) and others	The Prize for Excellent Presentation	For the presentation "A Guideline of Structuring New Idea Generation Methods Based on Classification of Idea Generation Methods"	Japanese Society for the Science of Design
2007/06/28	Shuzo Murakami (Professor, Faculty of Science and Technology)	Award of Excellency in Research (SB07-SEOUL)	For excellence in research entitled "Improving Sustainability of Building Blocks by Extended Use of Decentralized Combined Heat and Power System"	The Organizing Committee of SB07-SEOUL the International Conference on Sustainable Building Asia
2007/07/04	Shuzo Murakami (Professor, Faculty of Science and Technology)	ALAN G. DAVENPORT MEDAL	For outstanding contributions to wind engineering, with special regarding to the development of CFD techniques	International Association for Wind Engineering
2007/07/05	Kotaro Inoue (Associate Professor, Graduate School of Business Administration)	1st Mergers and Acquisitions Forum of Japan "RECOF Prize"	Published volume "M&A and Share Price" (Toyo Keizai Publishing, 2006)	Mergers and Acquisitions Forum of Japan
2007/08/03	Minoru Obara (Professor, Faculty of Science and Technology)	2007 Japan Society of Applied Physics Fellow Award (first year)	For the contribution to the development of high power lasers and their applications	The Japan Society of Applied Physics
2007/08/03	Toshiaki Makabe (Professor, Faculty of Science and Technology)	2007 Japan Society of Applied Physics Fellow Award (first year)	Pioneering contributions to modeling and design of low temperature plasma processes	The Japan Society of Applied Physics
2007/09/04	Hideyuki Maki (Research associate (Non-tenured), Faculty of Science and Technology)	Lecture encouragement prize of the 22th spring meeting, 2007, The Japan Society of Applied Physics	For "Direct observation of the deformation and the band gap change from an individual single-walled carbon nanotube under uniaxial strain"	The Japan Society of Applied Physics
2007/09/04	Yusuke Takeyoshi (M1, School of Integrated Design, Graduate School of Science and Technology) and others	Lecture encouragement prize of the 22th spring meeting, 2007, The Japan Society of Applied Physics	Excellent presentation and highly entitled "4 channel polymer parallel waveguide with graded-index cores for optical interconnection."	The Japan Society of Applied Physics

Date Awarded (YYYY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2007/09/06	Yu Sakazume (Associate Professor, Graduate School of Business Administration)	2006 Japan Society of Business Administration Best Paper Awards	A Study of Assembly Cells from the viewpoint of the theory of division of labor: Case Studies of Eight Manufacturing Companies in Japan	Japan Society of Business Administration
2007/09/07	Masafumi Hagiwara (Professor, Faculty of Science and Technology) and others	International Symposium on advanced Intelligent Systems (ISIS2007) Best Paper Award	For work entitled "User profiling system using social networks for recommendation"	International Symposium on advanced Intelligent Systems
2007/09/12	Masaki Kitajima (Professor Emeritus, School of Medicine)	KNIGHT'S CROSS ORDER OF MERIT OF THE REPUBLIC OF HUNGARY (civil division)	Mr. Kitajima awarded honoring his outstanding contribution to the development of academic relationship between Japan and Hungary in the field of surgery.	THE REPUBLIC OF HUNGARY
2007/09/12	Hideki Miyajima (Professor, Faculty of Science and Technology)	MSJ Society Award	Advanced Study on Magnetic Morphology of Ferromagnetic Materials	The Magnetics Society of Japan
2007/09/19	Mutsumi Imai (Professor, Faculty of Environment and Information Studies)	The Japanese Psychological Association International Encourage Prize	For contribution to the internationalization of Japanese psychology with outstanding achievements as a young member of the Association	The Japanese Psychological Association
2007/09/19	Shuichi Adachi (Professor, Faculty of Science and Technology) and others	2007 SICE Best Textbook Award	For collaboration of "Predictive Control with Constraints"	The Society of Instrument and Control Engineers
2007/09/20	Takashi Maeno (Professor, Faculty of Science and Technology) and others	VRSJ Outstanding Paper Award	Reflective Grasp Force Control of Humans Induced by Distributed Vibration Stimuli on Finger Skin with ICPF Actuators	The Virtual Reality Society of Japan
2007/09/20	Koji Suzuki (Professor, Faculty of Science and Technology)	JSAC Award 2007	The award was given by the scientific contribution on the creation and application of novel chemical sensing molecules and devices.	The Japan Society for Analytical Chemistry
2007/09/26	Minoru Obara (Professor, Faculty of Science and Technology)	The Badge of Honor	For Special Merit to the Bulgarian Academy of Sciences on Mr. Obara from Keio University, Yokohama, Japan for his outstanding scientific contributions, his endeavors to further cooperation in photonics and nanotechnologies with scientists from the Institute of Electronics of Bulgarian Academy of Sciences.	The Bulgarian Academy of Sciences
2007/10/01	Hiroya Tanaka (Associate Professor (Non-tenured), Faculty of Environment and Information Studies)	Japan Good Design Award (New Territory Design Category)	Mr. Tanaka has opened up new territory in application design, product design, interior design, and overall research design related to technology for the bio-electric potential detection of plants.	Japan Industrial Design Promotion Organization
2007/10/04	Naoki Aikawa (Professor, School of Medicine)	The Whitaker International Burns Prize	Mr. Aikawa has studied various aspects of extensive burns: the shock and reanimation phase, multiple organ failure, and humoral immune response, which he defined "cytokine storm".	The Giuseppe Whitaker Foundation
2007/10/12	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology) Yoshiki Ujiiie (Assistant Professor (Non-tenured), Faculty of Science and Technology) and others	Excellent Paper Award	For the paper "Mathematical Formulation of Macroscopic Feature"	The International Conference on Kansei Engineering and Emotion Research 2007
2007/10/15	Shun Ishizaki (Professor, Faculty of Environment and Information Studies)	2007 Minister of Economy, Trade, and Industry Award: Industrial Standardization Project (Individual)	As chairman of the IT specialists committee under the Japanese Industrial Standards Committee, Mr. Ishizaki has promoted the establishment of over 400 JIS standards and numerous revisions. As chairman of ISO/IEC JTS1 (IT), Mr. Ishizaki has been a leader in promoting Japanese standards as international standards. He has made many contributions in standardization activities in the field of information technology.	Ministry of Economy, Trade and Industry
2007/10/22	Toshiaki Makabe (Professor, Faculty of Science and Technology)	2008 American Vacuum Society: Fellow Award	For outstanding and sustained contributions to plasma modeling, simulation and diagnostics	American Vacuum Society
2007/10/25	Yuji Nagasaka (Professor, Faculty of Science and Technology) and others	Best Paper Award of the Japan Society of Thermophysical Properties	Sensing Technique for the Anisotropic Thermal Diffusivity in Micro-scale and Its Application for Material Processing, Proc. 26th Japan Symposium on Thermophysical Properties, pp.5	Japan Society of Thermophysical Properties
2007/10/30	Yasuhiro Koike (Professor, Faculty of Science and Technology)	The 2007 MOC Award	For pioneering research and continuous leadership in polymer photonics, including low-loss broad-band optical fibers and novel optical polymer devices.	The Thirteenth Microoptics Conference
2007/10/31	Yusuke Takeyoshi (M1, School of Integrated Design, Graduate School of Science and Technology)	MOC Student Paper Award	Mr. Takeyoshi's contributed paper on "Novel polymer optical waveguide" received high score from the reviewers.	The Japan Society of Applied Physics/The Optical Society of Japan/Microoptics group
2007/11/05	Takero Doi (Associate Professor, Faculty of Economics)	Nikkei Prize for Excellent Books in Economic Science	For a book "Economics of Local Bond System"	Nikkei Inc. and Japan Center for Economic Research
2007/11/08	Tojiro Aoyama (Professor, Faculty of Science and Technology) Yasuhiro Kakinuma (Research Associate (Non-tenured), Faculty of Science and Technology)	The Best Paper Award, The 4th International Conference on LEM21 of JSME	For "Micro machining of sort polymer material applying cryogenic cooling", The 4th International Conference on LEM21 of JSME, pp.713-718 (2007)	The Manufacturing and Machine Tool Division and the Manufacturing Systems Division, JSME
2007/11/08	Tojiro Aoyama (Professor, Faculty of Science and Technology) Yasuhiro Kakinuma (Research Associate (Non-tenured), Faculty of Science and Technology)	The Best Paper Award, The 4th International Conference on LEM22 of JSME	For "Development of fixture element for vacuum transportation of silicon wafer using electro-rheological gel", The 4th International Conference of LEM21 of JSME,	The Manufacturing and Machine Tool Division and the Manufacturing Systems Division, JSME
2007/11/09	Takuya Satomura (Associate Professor, Faculty of Business and Commerce) Yutaka Hamaoka (Professor, Faculty of Business and Commerce)	Yoshida Hideo Memorial Prize for Best Aided Research.	For a research "Impact of WOM and eWOM on Consumer Decision Making and Market Response " (2nd place without first place)"	Yoshida Hideo Memorial Foundation



Date Awarded (YYYY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2007/11/21	Takahira Yamaguchi (Professor, Faculty of Science and Technology)	The Okawa Publications Prize	Mr. Yamaguchi have written well this book with their rich experience in order to make data mining an established field in computer science.	The Okawa Foundation for Information and Telecommunications
2007/11/22	Ryuji Wakikawa (Associate Professor (Non-tenured), Faculty of Environment and Information Studies)	9th Ericsson Young Scientist Award (2007)	Mobile IP, Network Mobility, Mobile Ad-hoc Network	Nippon Ericsson K.K.
2007/12/11	Takero Doi (Associate Professor, Faculty of Economics)	Suntory Prize for Social Sciences	For a book <i>"Economics of Local Bond System"</i>	Suntory Foundation
2007/12/11	Noburu Notomi (Associate Professor, Faculty of Letter)	Suntory Prize for Social Sciences	This prize cites Mr. Notomi for his book <i>"Who is the Sophist?"</i> (Jimbunshoin, 2006)	Suntory Foundation
2007/12/13	Toshiki Nishiyama (Associate Professor (Non-tenured), Graduate School of Media and Governance)	EcoDesign 2007 Best Poster Award	Mr. Nishiyama has received wide acclaim for his contributions to a universal design and an eco design for preventing passengers from falling over inside a moving bus. Specifically, Mr. Nishiyama has proposed the introduction of advanced anti-slipping flooring made of silica and marble. After evaluation by users, technical and political hurdles to introduction were examined. And it was these efforts that led to establishment of a universal-eco design.	Union of EcoDesigners
2008/01/03	Miki Seko (Professor, Faculty of Economics) Michio Naoi (Associate Professor (Non-tenured), Faculty of Business and Commerce) and others	European Real Estate Society / Journal of Property Research Prize Paper Award	For the paper <i>"Earthquakes and the Quality of Life in Japan"</i>	European Real Estate Society
2008/02/04	Hideyuki Okano (Professor, School of Medicine)	24th Inoue Prize for Science	Mr. Okano received this prize for excellent research contributions in "Regenerative Medicine of the Central Nervous System based on the Stem Cell System."	Inoue Foundation of Science
2008/02/16	Koji Fukagata (Associate Professor/Lecturer, Faculty of Science and Technology)	Japan Society of Fluid Mechanics 2007 Ryumon Award	For the paper <i>"Contribution of Reynolds stress distribution to the skin friction in wall-bounded flows"</i> (K. Fukagata et al., Phys. Fluids 14, L73-L76 (2002))	Japan Society of Fluid Mechanics
2008/03/04	Takaaki Ishigure (Associate Professor/Lecturer, Faculty of Science and Technology)	Marubun Award for Scientific Researchers	Achievements in research and development of low dispersion plastic optical fibers and waveguides for optical interconnections.	Marubun Research Promotion Foundation
2008/03/23	Ikuo Takahashi (Professor, Faculty of Business and Commerce)	Best of the Best Conference Paper Award, 2008 Global Marketing Conference at Shanghai	Mr. Takahashi received this award for his paper entitled <i>"Structural Determinants of Retail Market Potential in Japan, 2002."</i>	Charles R. Taylor and three other conference directors (from Europe and the USA), the Korean Academy of Marketing Science, the China Marketing Society, and two other universities and one organization (conference hosts)
2008/03/27	Kimihsa Yamamoto (Professor, Faculty of Science and Technology)	The Chemical Society of Japan Award for Creative Work	The achievement is "The Development of Functional Materials Based on Metallodendrimers" for a leading contribution to the fundamentals and applications of chemistry.	The Chemical Society of Japan

## Introduction to the Keio University research databases

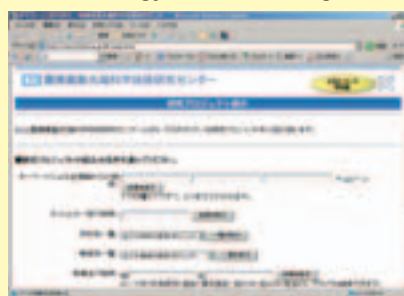
### K-RIS (Keio Research Information System)



K-RIS provides information on all researchers at Keio University. The database can be searched in various ways, including by keyword, researcher affiliation, or published paper.

[http://www.k-ris.keio.ac.jp/index\\_en.html](http://www.k-ris.keio.ac.jp/index_en.html)

### Keio Leading-Edge Laboratory of Science and Technology (KLL) Yellow Pages



Introduction to the current research projects at the Yagami Campus, Science and Technology Department.

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

### Keio Research Institute at SFC Yellow Pages



Introduction to the current research projects at the Shonan-Fujisawa Campus Research Institute

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

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# Access Information

## Mita Campus

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

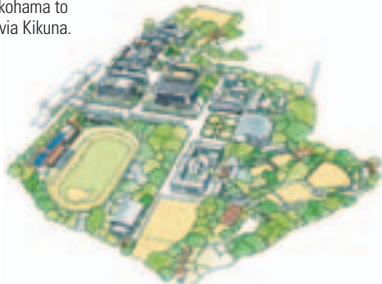
- Faculty of Letters (2-4 years), Faculties of Economics / Law / Business and Commerce (3-4 years)  
Graduate Schools of Letters / Economic / Law / Human Relations Business and Commerce, Law School
- 8-minute walk from Tamachi St. (JR Yamanote Line or JR Keihin Tohoku Line);  
Approximately 10 minutes 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. (Toei Subway Asakusa or Mita Line);  
Approximately 15 minutes by train from Suidobashi to Mita.
- 8-minute walk from Akabanebashi St. (Toei Subway Oedo Line).



## Hiyoshi Campus

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

- Faculty of Letters / School of Medicine / Faculty of Pharmacy (1 year), Faculty of Economics / Law / Business and Commerce Science and Technology (1-2 years)  
Graduate School of Business Administration (Keio Business School)  
Graduate School of Media Design  
Graduate School of System Design and Management
- 1-minute walk from Hiyoshi St. (Tokyu Toyoko Line or Yokohama Subway 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.



## Yagami Campus

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

- Faculty of Science and Technology (3-4 years)  
Graduate School of Science and Technology
- 15-minute walk from Hiyoshi St. (Tokyu Toyoko Line or Yokohama Subway 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.



## Shinanomachi Campus

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

- School of Medicine (2-6 years), Faculty of Nursing and Medical Care (3 years)  
Graduate School of Medicine
- 1-minute walk from Shinanomachi St. (JR Sobu Line);  
Approximately 6 minutes by train from Shinjuku to Shinanomachi.  
Approximately 15 minutes by train from Tokyo to Shinanomachi.
- 5-minute walk from Kokuritsu-kyogijo St. (Toei Subway Oedo Line).



## Shonan Fujisawa Campus

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

- Faculty of Policy Management / Environment and Information Studies (1-4 years)  
Faculty of Nursing and Medical Care (1, 2, or 4 years)  
Graduate School of Media and Governance / Health Management
- Approximately 15 minutes by bus from Shonandai St. (Odakyu Enoshima Line, Setetsu 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.



## Shiba Kyoritsu Campus

1-5-30 ShibaKoen, Minato-ku, Tokyo 105-8512  
Tel +81-3-3434-6241

- Faculty of Pharmacy (2-4 or 2-6 years)  
Graduate School of Pharmaceutical Sciences
- 10-minute walk from Hamamatsu-cho St. (JR Yamanote Line or Keihin-Tohoku Line);  
Approximately 6 minutes by train Tokyo to Hamamatsu-cho.  
Approximately 13 minutes by train from Ueno to Hamamatsu-cho.  
Approximately 16 minutes by train from Shibuya to Hamamatsu-cho.
- 2-minute walk from Onarimon St. (Toei Subway Mita Line);  
Approximately 5 minutes from Ote-machi to Onarimon.  
Approximately 35 minutes from Hiyoshi to Onarimon.
- 6-minute walk from Daimon St. (Toei Subway Asakusa Line or Oedo Line);  
Approximately 16 minutes from Shinjuku to Daimon.  
Approximately 7 minutes from Nihonbashi to Daimon.



## Shin-Kawasaki Town Campus

7-1 Shin-Kawasaki, Saiwai-ku, Kawasaki-shi, Kanagawa  
212-0032  
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

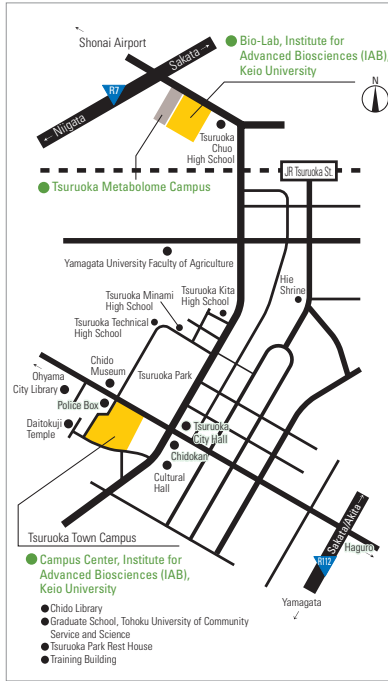
Center Building  
14-1 Baba-cho, Tsuruoka-shi, Yamagata 997-0035  
TEL +81-235-29-0800



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



- By air: approximately 50 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

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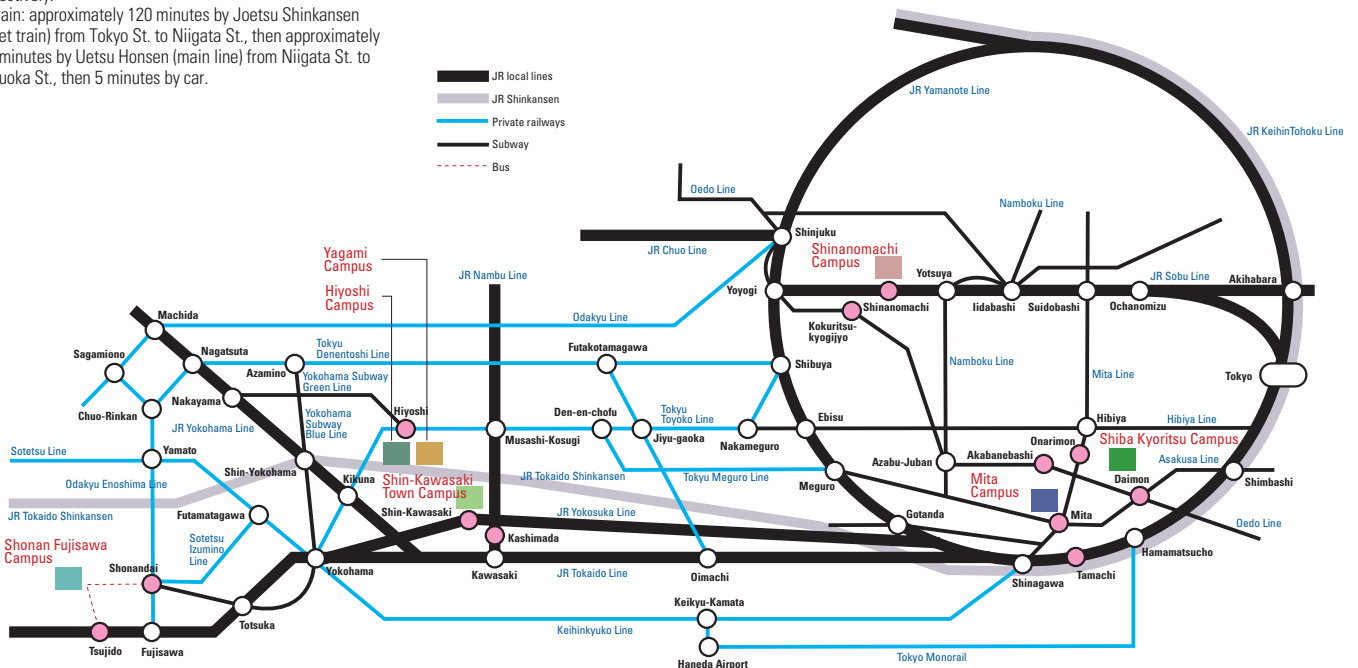
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Design the Future

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