

# Keio University Annual Report on Research Activities 2005–2006

Creating Leading-Edged Research Centers and  
Advancing International Collaboration



KEIO 150  
Design the Future

150th Anniversary in 2008

Keio University  
Annual Report on Research Activities  
2005–2006

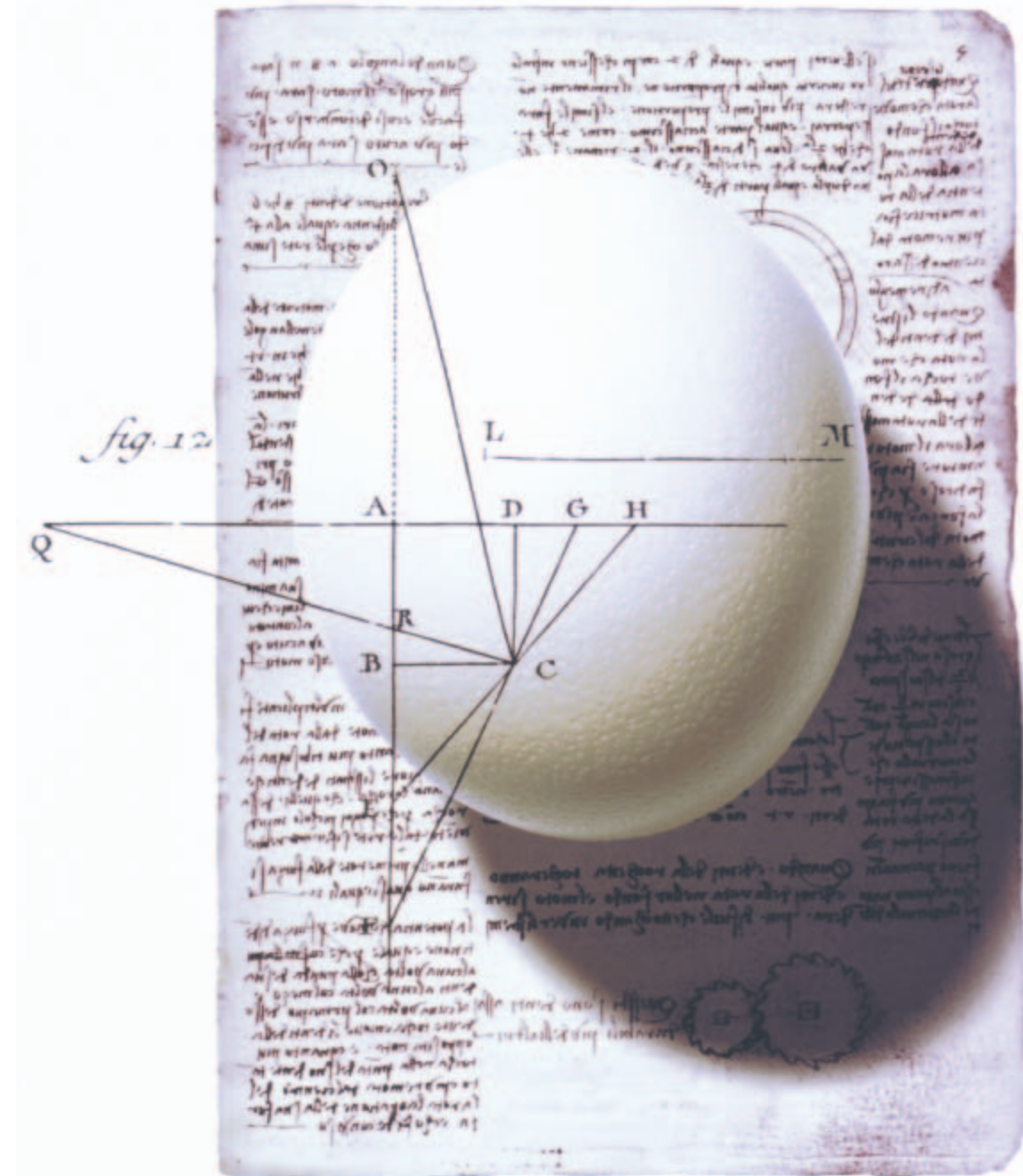
20 November 2006

Published by the Center for Research Promotion

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

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Keio University



Since the founding of universities in Bologna and Paris in the 12th century, the mission of the university has been the creation and accumulation of knowledge. This mission has traditionally involved maintaining a neutral position in relation to society and an outlook that extends beyond short term trends. At a distance from the unpredictable, changing and market driven world, universities have been able to devote themselves to the development of pure knowledge and research, the results of which have played an important role in societal progress.

Universities should reflect the needs of the era, of the country, of the local community, and increasingly of the global community as well. It is clear that we are now facing complex, unprecedented changes on a global scale, and as pillars of society, universities are now expected to play a greater role in contributing to the real world by providing services to the community. Collaborative partnerships with industry and governments, provision of medical services and health care, and training of tomorrow's leaders have been added to the university's more traditional roles of creating and accumulating knowledge.

Imagine the traditional "ivory tower" style university as a circle: a geometric shape with a single, central focus. Keio University believes that universities in the 21st century must broaden their commitments, and can best be represented by an ellipse: a shape with two equal focuses in dynamic balance with one another.

One of these focuses is remaining independent from economic society in order to promote basic research and the ongoing creation of new knowledge. Economic society is by nature unstable and rapidly changing, so in order for knowledge creation to progress and break ground in new fields, it must take place outside the realm of market driven influences. The other focus is being directly committed to collaborating with society. The university has unique resources which, through innovation and collaboration with community partners, can be put to direct use to improve society.

Keio is taking a variety of steps to realize the University's "double-focus" vision, including the establishment of the Organization for Research Advancement and Administration (ORAA). The Organization was set up to further develop cross-disciplinary research activities, as well as collaborative partnerships with industry, governments and other universities worldwide.

University research activities have always been an important factor in societal progress. Thus, it is very important for universities to communicate their research activities to the public. Keio's Annual Report on Research Activities provides the community with information regarding our strategies and direction, as well as our current research activities. We believe that a strong focus on developing the international collaboration is essential to achieve our goal of becoming a truly world class university. This report also refers to our recent development in international collaboration. We hope that this Report will give you a better understanding of what Keio University is doing to accomplish its double-focus vision and contribute to the advancement of society.

Yuichiro Anzai  
President  
Keio University



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

### Offices of Research Administration

Support research activities at all campuses

The Offices of Research Administration, which support research in while maintaining close contact with individual researchers, are located at the five campuses in Mita, Hiyoshi, Yagami, Shinanomachi, and Shonan Fujisawa. In addition to functioning as the contact point on each campus for outside organizations and inquirers, these Offices provide administrative support for researchers in collaboration with the Organization for Research Advancement and Administration (ORAA). Specifically, the Offices provide information to researchers in areas such as research resources, research environments, and opportunities for research subsidies from inside and outside Keio University (public calls for subsidy applications), and also offer a variety of other support services including for negotiations and conclusion of contracts for joint or commissioned research, management of research expenses and research spaces, and compilation and presentation of research results.

## Organization for Research Advancement and Administration (ORAA)

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

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

### Center for Integrated Education System

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

### Incubation Center

Supports incubation activities throughout Keio University

The goal of the Incubation Center is to support and promote "incubation activities" aimed at transferring the results of research at Keio University to other areas of society. The "Keio Fujisawa Innovation Village" was opened in March 2006 as a core facility of the "Keio University Collaborative Entrepreneur Development Program," through the combined efforts of Keio University, the Organization for Small and Medium Enterprises and Regional Innovation JAPAN (SMRJ), Kanagawa Prefecture, and Fujisawa City.

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.

### The Roles and Functions of the ORAA

The ORAA is comprised of various Centers and Committees, including: the Center for Research Promotion, the Incubation Center, the Intellectual Property Center (IPC), 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.

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

### Intellectual Property Mediation Committee

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

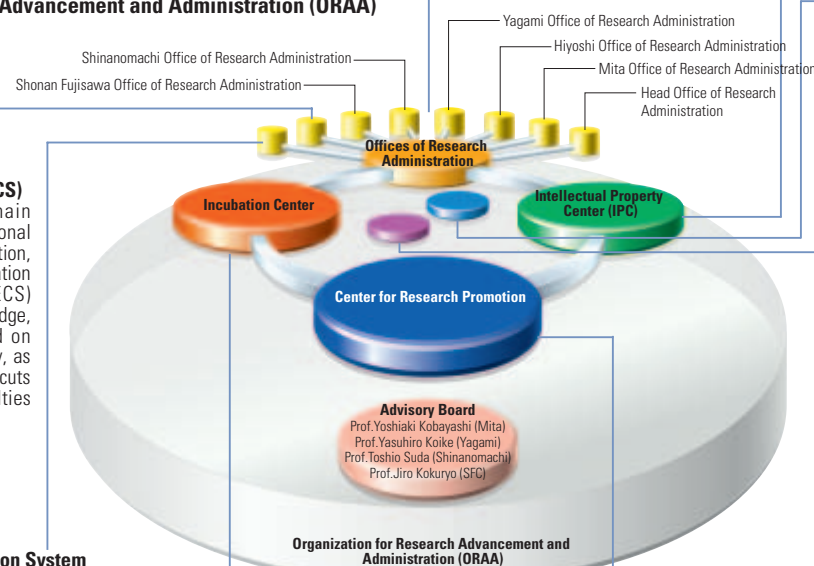
### Research Ethics Committee

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

### Center for Research Promotion

The central point of contact for collaborations among industry, government, and academia

The Center for Research Promotion is dedicated to planning and promotion of comprehensive research projects. Its three main functions are: (1) to plan and promote comprehensive and strategic projects at Keio University; (2) to gather the latest information on research grants and subsidies and provide it to researchers; and (3) to transmit the results of comprehensive research at Keio University through symposiums and other media. To achieve the above objectives, the Center receives suggestions from the Advisory Board, and cooperates with the other organizations of the ORAA – the Intellectual Property Center, the Incubation Center, and the Offices of Research Administration – in a wide range of activities, including the startup of specific research projects.



## Guide to Research Activities at Keio University

"I'm thinking about doing joint research with Keio University. Who should I contact first?"  
 "I'd like to obtain a copy of the 'Keio University Annual Report on Research Activities'."  
 "Could you send me information on research-related events by e-mail?"

**Center for Research Promotion**  
<http://www.crp.keio.ac.jp/en/index.html>  
 E-mail: [crp@keio.ac.jp](mailto:crp@keio.ac.jp)

"I'd like to learn more about the intellectual property owned by Keio University."  
 "I need some advice regarding licensing of patented technologies."  
 "I'd like to participate in some of the events and activities held by the Intellectual Property Center, such as the Keio Technology Licensing Forum, the Venture Private Conference, or the Keio Innovation Network."

**Intellectual Property Center**  
<http://www.ipc.keio.ac.jp/english/index.html>  
 E-mail: [toiawasesaki-ipc@adst.keio.ac.jp](mailto:toiawasesaki-ipc@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 want to search for Keio University research information on the homepage."

**Keio Researchers Information System (K-RIS)**  
[http://www.k-ris.keio.ac.jp/index\\_en.html](http://www.k-ris.keio.ac.jp/index_en.html)

"I'd like to get some detailed information on research activities at the Keio Research Institute at SFC (Shonan Fujisawa Campus), and on events like the Open Research Forum (ORF)."

**Keio Research Institute at SFC**  
<http://www.kri.sfc.keio.ac.jp/english/index.html>

"I'm interested in a Research Project at the Shin-Kawasaki Town Campus."  
 "I'd like to participate in a seminar being held at the Shin-Kawasaki Town Campus."

**Shin-Kawasaki Town Campus**  
<http://www.k2.keio.ac.jp/>

"I'd like to find out 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/>

## Events

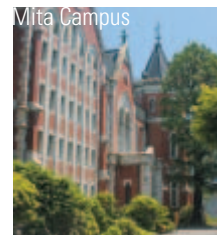
FY2005 (April-March)

DD/MM/YY	Event	Host	Site
9/16/05	Symposium on the 21st Century COE Programs adopted in FY2003: Interim Report	Head Office of Research Administration	Mita and Shinomachi
21/4/05	The 2nd Keio Innovation Network	Intellectual Property Center	Mita
10-11/5/05	Venture Private Conference	Intellectual Property Center	Mita
27/5/05	The 3rd Keio Innovation Network	Intellectual Property Center	Mita
28/6/05	The 4th Keio Innovation Network	Intellectual Property Center	Mita
6-7/7/05	Ministry of Education, Culture, Sports, Science, and Technology Leading Project for Biomimulational - International Symposium	Shinomachi Campus Office of Research Administration	Mita
23/7/05	Keio University Center for Research Promotion Symposium "Design the Future: IT Returns to the People"	Center for Research Promotion	Mita
26/7/05	The 5th Keio Innovation Network	Intellectual Property Center	Mita
3-5/8/05	Keio Summer Bio Camp 2005	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
17-19/8/05	Summer Bio College 2005	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
31/8/05	The 4th Technology Transfer Forum in Osaka	Intellectual Property Center	The Osaka Chamber of Commerce and Industry
9-10/9/05	Search for New RNA/RNP Meeting	Institute for Advanced Biosciences	Tsuruoka Town
27/10/05	The 6th Keio Innovation Network	Intellectual Property Center	Mita
12/11/05	Open Campus 2005 - Introducing Research Projects at K'	Shin-Kawasaki Town Campus	Shin-Kawasaki Town
12/11/05-28/1/06	K' Open Seminar and Techno Juku (7 Saturdays)	Shin-Kawasaki Town Campus	Shin-Kawasaki Town
22-23/1/05	SFC Open Research Forum 2005	Keio Research Institute at SFC	Roppongi Hills
24/11/05	The 7th Keio Innovation Network	Intellectual Property Center	Mita
26/11/05	"Brilliant and Exciting Science: Welcome to the University Lab"—KAKENHI: Returning and Diffusing the Achievements of Research	Head Office of Research Administration	Yagami and Shin-Kawasaki Town
2/12/05	The 8th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2005	Yagami Campus Office of Research Administration and KLL	Tokyo International Forum
14-15/12/05	Venture Private Conference	Intellectual Property Center	Mita
15/12/05	Intellectual Property Center Symposium "Big Corporations or Ventures: Our Venture Stories"	Intellectual Property Center	Mita
20-21/12/05	Hiyoshi Research Portfolio 2005	HRP2005 Steering Committee	Hiyoshi
22/12/05	The 8th Keio Innovation Network	Intellectual Property Center	Mita
1/2/06	Keio Symposium for Leading-Edge Science and Technology - The Frontier of 21st Century Brain Sciences	Center for Research Promotion	Mita
22/2/06	The 9th Keio Innovation Network	Intellectual Property Center	Mita
10/3/06	The 4th Four Universities of East-West Japan Forum for Industry-Academia-Government Collaboration	Keio University Intellectual Property Center, Doshisha University Liaison Office, Ritsumeikan University BKC Liaison Office, and Waseda University Office of Intellectual Property	Keidanren Kaikan Hall
24/3/06	Intellectual Property Center Symposium "Spurring Innovation in Universities"	Intellectual Property Center	Mita

FY2006 (April-March)

DD/MM/YY	Event	Host	Site
24/5/06	The 10th Keio Innovation Network	Intellectual Property Center	Mita
6-7/6/06	Venture Private Conference	Intellectual Property Center	Mita
7/6/06	Intellectual Property Center Symposium "The Future of Venture-Created Japan"	Intellectual Property Center	Mita
27/6/06	The 11th Keio Innovation Network	Intellectual Property Center	Mita
22/7/06	Keio University Center for Research Promotion Symposium "Designing the Future with Sports: The Research and Promotion of Sports Medicine/Sciences and Culture"	Center for Research Promotion	Mita
26/7/06	The 12th Keio Innovation Network	Intellectual Property Center	Mita
30/7/06	"Brilliant and Exciting Science: Welcome to the University Lab"—KAKENHI: Returning and Diffusing the Achievements of Research	Head Office of Research Administration	Mita
3-5/8/06	Keio Summer Bio Camp 2006	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
21-23/8/06	Summer Bio College 2006	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
26/8/06	IAB Open Campus 2006	Institute for Advanced Biosciences	Tsuruoka Town
10-11/11/06	The 1st Metabolome Symposium "The Future of Life Sciences through Metabolomics"	Institute for Advanced Biosciences	Tsuruoka Town
TBD	Open Campus 2006 - Introducing Research Projects at K'	Shin-Kawasaki Town Campus	Shin-Kawasaki Town
TBD	K' Open Seminar	Shin-Kawasaki Town Campus	Shin-Kawasaki Town
22-23/11/06	SFC Open Research Forum 2006	Keio Research Institute at SFC	Marunouchi Building, other venues
1/12/06	The 7th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2006	Yagami Campus Office of Research Administration and KLL	Tokyo International Forum
15-16/12/06	Hiyoshi Research Portfolio 2006	HRP2006 Steering Committee	Hiyoshi
17-18/1/07	Ministry of Education, Culture, Sports, Science, and Technology Leading Project for Biomimulational - Symposium	Shinomachi Campus Office of Research Administration	Mita
TBD	Keio Symposium for Leading-Edge Science and Technology	Center for Research Promotion	Mita

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



## Research Centers

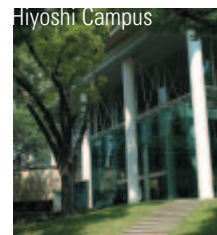
## Mita Campus/ Hiyoshi Campus

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

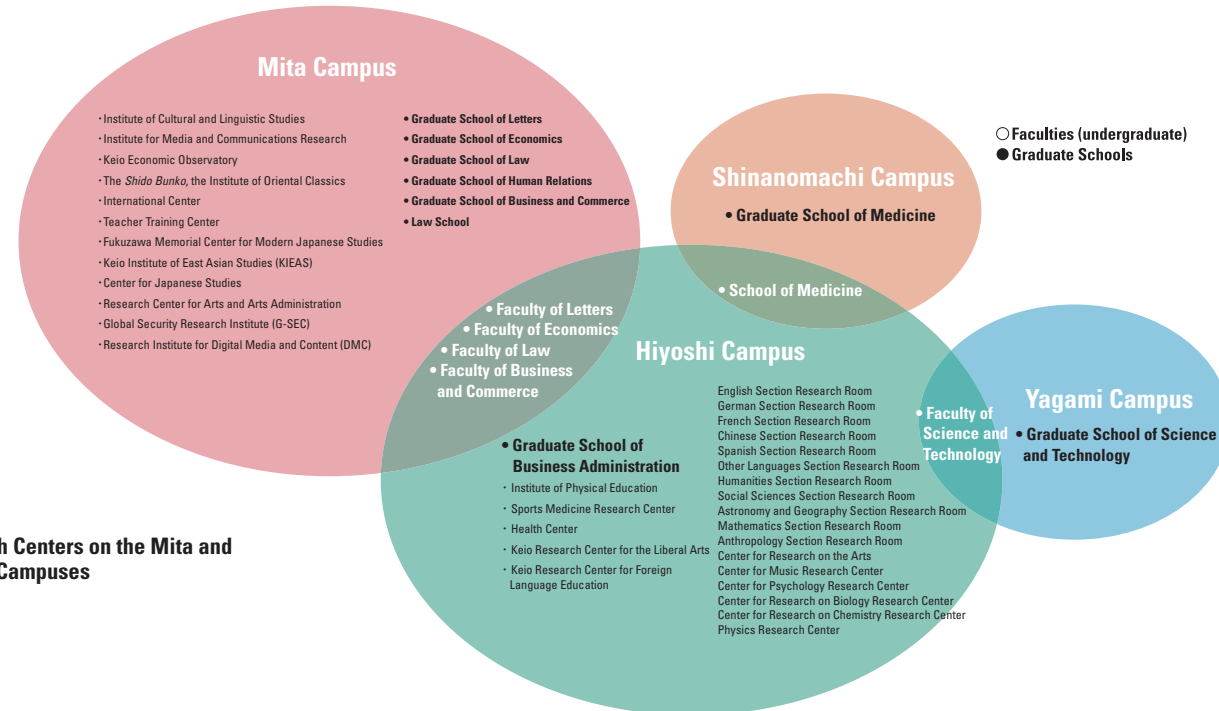
## For Inquiries:

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

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



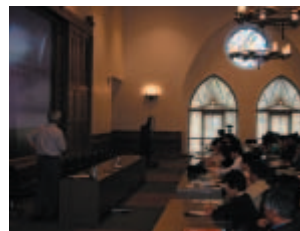
The Mita Campus is home to undergraduate faculties (primarily for third- and fourth-year students), graduate schools (six graduate schools), and independent research institutions. The Hiyoshi Campus houses undergraduate departments in the humanities, social sciences, and natural sciences (primarily for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



### Research Centers on the Mita and Hiyoshi Campuses

#### Institute of Cultural and Linguistic Studies

The Institute of Cultural and Linguistic Studies is an academic institution independent from the University faculties. The Institute investigates the nature of human cognitive capacities and socio-cultural interactions by adopting an interdisciplinary approach across the humanities, social sciences, and natural sciences. Currently, a permanent faculty of the seven scholars, specializing in theoretical linguistics, typological linguistics, psycholinguistics, philosophy of language, Hellenistic literature, Islamic thought, and Vietnamese history, guides the direction of the research projects at the Institute, bringing together faculty members with common interest broadly from all the schools of the University. Outcomes of the ongoing projects are reported in the Institute's annual bulletin, and major results are published in its monograph series. The Institute also offers a range of language courses at the undergraduate and graduate level, including Akkadian, Arabic, Cambodian, Egyptian, Hebrew, Korean, Persian, Sanskrit, Thai, Turkish, and Vietnamese.



Public seminar hosted by the Institute

The faculty also participates as vital members of "Toward an Integrated Methodology for the Study of the Mind," a program of Keio University's 21st Century COE Program (Humanities), started in FY2002. In FY2005, the Institute hosted a public lecture series that evaluated and examined from three perspectives the extent to which the "Methodological Preliminaries" as set forth in the first chapter of Chomsky's *Aspects of the Theory of Syntax* (1965) could be justified.

The Institute invites prominent lecturers and holds linguistic colloquia three times a year that attract the attention of the academic community. It also sponsors the Tokyo Conference on Psycholinguistics, an international academic forum whose status has grown year after year. Papers presented are collected in an English publication as research results are steadily generated by the conference. As part of its education-related activities, the Institute has established special courses, including Asian and ancient Middle Eastern languages, which are not offered by the University faculties. During the 2005 academic year, the Institute offered a total of 23 courses in 11 languages.

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

#### Institute for Media and Communications Research

The Institute for Media and Communications Research promotes research projects financed by its own research funds as well as special donations to the Institute. During FY2005, the Institute conducted the following four projects: "Images of the World as Constructed by Foreign-Related News Stories: An Empirical Analysis," "Revolution of Media Environment and Digital Contents," "Power and Journalism," and "Internet Development and Civic Culture in Japan." In addition to these projects, "Risk Communications for Safe Society," a project funded by Keio Gijuku Academic Development Funds, was conducted with three research units. The results of these research projects were published in the journals *Keio Media and Communications Research* No.56 in Japanese and *Keio Communication Review* No.28 in English. Also at the annual symposium, some portions of research results were presented. The Institute also serves as a research unit for a large research project entitled "The 21st Century Center of Excellence (COE) Program," funded by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The research projects above are closely related to this COE program. Some publications are available on the website below.

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



Symposium "The Convergence of Real and Network Society"

#### Keio Economic Observatory

The Keio Economic Observatory was established in 1959 for the purpose of conducting theoretical and empirical research on the economy and industries in the context of Japan's existing economic conditions.

The Institute consists of the following three sections: Economics, Law, and Behavioral Science. In fiscal 2005, we carried out various projects as follows:

## Economics:

Global environment and economic activity, flow of funds analysis, market theory, input-output analysis, labor market theory

## Law:

Competition law, intellectual property law, economic order and law, consumer problems and policies, social security system

## Behavioral Science:

Oral history of Japanese postwar industrial relations, mentoring and empowerment in organizations, information and communication in organizations, work and family interface

Research results are published as *KEO Discussion Papers*. Some of these papers are released in the following URL:

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

#### Shido Bunko, Institute of Oriental Classics

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

In 2005, in order to study Oriental classical books, members of *Shido Bunko* visited the People's Republic of China, the Republic of China, and the United States with research funding provided by Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Interchange Association, Japan. One of the highlights of the study came when the members were invited by the Research Center for East Asian Culture at the National Taiwan University to collaborate with them on editing the catalog of their collections. Also in 2005, *Shido Bunko* held its annual open lecture on October 19, entitled "Chinese Classics Printed in Japan" by Dr. Kozo Nagasawa, assistant professor at Teikyo University.

*The Shido Bunko Journal* No.40 was issued in February 2006, and *The Collection of Biographies of Shotoku Taishi in Medieval Times* (5 vols), edited by *Shido Bunko*, was published by Bensei Shuppan in April 2005.

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

#### International Center

The International Center is at the core of Keio University's international activities. It is responsible for sending numerous students and scholars abroad every year, as well as welcoming those coming to the University.

The Center provides support to international students on both academic and lifestyle levels, and is also in charge of exchange programs and short-term overseas research programs. For these purposes, it holds information sessions on studying abroad in general, and also provides information on exchange programs.

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

Educational activities and research on intercultural learning include offering several courses through the International and Japanese Studies courses mentioned above, and publishing a paper on intercultural communication. The paper, written by a professor of the Action-Oriented Plurilingual Competence Development Research Unit in the Keio Research Center for Foreign Language Education, reports on a class on intercultural communication, and analyses its effects. The paper can be read in the *Summary of Research Activities*, April 2004 – March 2006, published by the Keio Research Center for Foreign Language Education.

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

#### Teacher Training Center

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



Completion ceremony of the 1st Certificate Course of School Education

One of the main research projects at the Center since 2004 has been the study of educational assessment of student teachers. The other project has been the development of an advanced curriculum for teacher-training courses. As a result, the Certificate Course of School Education was established in April 2005.

Based on the projects, the Center is promoting a new expansion project: "Logbook for the Ideal Teacher." The project's goal is the development of an Internet multi-assessment system of aptitude for the teaching profession. This project was selected for the "Nurturing of Outstanding Teachers Program" by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in July 2006.

In connection with the projects, open seminars are held every year. In addition, the Center emphasizes continuing education for active teachers, and hosts open seminars every summer and programs on other occasions for in-service training.

<http://www.gakuji.keio.ac.jp/etc/kyoshoku/>

#### Fukuzawa Memorial Center for Modern Japanese Studies

The Center has three major roles in the activities of the University. The first role is to serve as a University archive that collects, organizes, and stores the historical documents of Keio University and of its founder, Yukichi Fukuzawa. The second role is to provide a research institute in which scholars may study a comprehensive selection of modern Japanese history related to Fukuzawa and Keio University. The third role is as an educational organization that returns the fruits of these scholarly activities not only to the students but also to the public through its courses, lectures, and seminars. Since 2005, the Center has provided the following special courses at the Mita campus: "Modern Japanese Studies," "*The Encouragement of Learning and Its Era*," and seminars on the Fukuzawa text *Popular Discourse on People's Rights and Popular Discourse on National Rights* in the Spring semester; and in the Fall semester, courses on the origins of *To Be Independent and Self-sufficient* and seminars on Fukuzawa's letters. The University has approved these courses; as such, students will receive credits towards their graduation for enrolling in the Center's courses.

As part of its 2005 research activities, the Center held a variety of lectures and seminars on such themes as economic thought in the Meiji era and Yukichi Fukuzawa, and law in the Meiji era and Yukichi Fukuzawa. The Center also attempts to study Yukichi Fukuzawa and Keio University in the context of the history of modern thought in East Asia and throughout the world. For example, the Center has invited researchers from Korea to engage in comparative studies on the view of women, the change of the status of women, and the theory of the family in modern Korea and Japan. Guest speakers from Europe have been invited to the Center, and researchers from western countries and Asia are active in their roles as visiting academic staff.

More recently, the Center's staff has begun editing the 21-volume collection of historical data of Keio University, as part of the Center's preparations to commemorate in 2008 the 150th anniversary of the founding of the University.

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

#### The Keio Institute of East Asian Studies (KIEAS)

The Keio Institute of East Asian Studies (KIEAS) has four research projects simultaneously each year. The following four projects were conducted in 2005: "The Russo-Japanese War," "Political Order in Southeast Asia," "New Perspectives on China's Medium and Small-Sized Enterprises," and "Modern Japan's Legal and Political Thoughts: In Search of a Re-evaluation of Fukuzawa Yukichi." Each project presented its research results at the academic forum held annually at the Institute. In 2005 the Institute held international conferences such as "One Hundred Years since the Russo-Japanese War" and "China's Diplomacy and Relations with Japan." The Institute also established an academic exchange agreement with the Center for Japanese Studies at Dongseo University in Korea. Please check our homepage which provides information of activities held by the Institute, including seminars and lectures.



International conference "One Hundred Years since the Russo-Japanese War"

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

## Center for Japanese Studies

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

The Center is in charge of the Japanese language and culture courses offered at the University, and of the 209 students, coming from 38 countries and regions, who participate in its Japanese Language Program. It also holds Japanese language courses for the international students enrolled in the undergraduate program at the Hiyoshi campus and in graduate studies at the Graduate School of Science and Technology at the Yagami campus. The Center also implements various courses for those who participate in the Program for Teaching Japanese as a Foreign Language.



*Nihongo to Nihongo Kyoiku (Japanese and Japanese Language Education), March 31, 2006, ISSN 0286-5742*

In the 2005 academic year, the Center published *Nihongo to Nihongo Kyoiku (Japanese and Japanese Language Education)*, March 31, 2006, ISSN 0286-5742.

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

## Research Center for the Arts and Arts Administration

The Research Center for the Arts and Arts Administration at Keio University is a research center that pursues the arts such as the fine arts, architecture, music, literature, theater, cinema, and dance, as well as their cultural appreciation in contemporary society from a holistic and academic stance.



*The Duesseldorf University Orchestra in concert*

The staff members, faculty members, and museum curators, in cooperation with experts, develop domain-transcending activities such as seminars, lectures, exhibitions, performances, workshops, case studies for art management, and construction of art archives. Their original style of research has brought forth fruitful results.

In 2005, the Center held a concert by the Duesseldorf University Orchestra as part of "Deutschland in Japan 2005/2006" festivities; a lecture by the art critic and curator Maria de Corral, co-sponsored by Spanish Embassy; the exhibition "Shuzo Takiguchi 1958: Traveling through His Eyes"; Butoh performances; workshops; and lectures.

The result of these researches are released to the public through publications such as *ANNUAL REPORT 12 (2004/2005)* (54 pages / 5 April 2005), concentrating on events; and newsletters *ARTLET No.24, Shuzo Takiguchi: Traveling through His Eyes* (8 pages / 15 September 2005); *ARTLET No.25, Reality in the Movie* (8 pages / 31 March 2005); and *Booklet No.14, To and From Shuzo Takiguchi* (88 pages / 31 March 2006).

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

## Global Security Research Institute (G-SEC)

The three core subjects of G-SEC's ongoing research on current issues are:

## 1. 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. Asian Security Systems

Research on this subject examines pluralistic and diverse security systems in East Asia including Southeast Asia, with academic exchanges engaged with junior researchers from research institutes and universities in East Asian regions.

## 3. Emerging Crises for Human Security

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

## Symposiums:

"International Seminar on Reforming Health Social Security" (June 27-29), "Sino-Japan 'Frictions' through Media" (December 13), "Designing the Future with Digital Earth" (February 8), "Examining China's Governability" (March 7), "Corporate Values and Customer Strategies in the Knowledge Era" (March 23), "Symposium for Future Scientific Development and Innovation" (March 30)

Results of these researches have been published in G-SEC Working Papers.

[http://www.gsec.keio.ac.jp/index\\_e.html](http://www.gsec.keio.ac.jp/index_e.html)

## Research Institute for Digital Media and Content (DMC)

The Research Institute for Digital Media and Content (DMC Institute), established in 2004, promotes international research and collaboration under a project-based contract system. This project system focuses its research on contextual digital content from various perspectives such as content design, media technology, network technology, and content policy. As part of pursuing its research in an international context, in 2005 the DMC Institute established Global Studios at Tsinghua University in China and Yonsei University in South Korea.



*Digital Content Studio*

The DMC Institute distributes its research results globally by hosting international symposiums and participating in international conferences. In July 2005, the DMC Institute hosted a symposium entitled "Mirror of the World: Contributions of Digital Technology to the Inheritance of Human Memory — Rebuilding the Dresden Frauenkirche and Staatliche Kunstsammlungen Dresden (SKD)." This symposium was part of the events of "Deutschland in Japan 2005/2006." In September 2005, the DMC Institute participated in iGrid 2005, an international networking conference at which it successfully completed the world's first international real-time streaming of 4K digital cinema, linking the University of California, San Diego and Keio University in Tokyo over 9,000 miles. In March 2006, the DMC Institute hosted "The Japan-Korea Media Convergence Policy Symposium 2006," with attendance by policymakers from known broadband superpowers, Japan and Korea. Also in March, the DMC Institute demonstrated its Global Studios network at an international symposium it hosted entitled "Global Sharing of Wisdom in the Digital Communication Era."

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

## Institute of Physical Education

The Institute of Physical Education (20 staff members) was established in 1961. It was founded with the purpose of developing University-level physical educational courses. At the same time, the Institute was, from the outset, expected to conduct a wide-range of notable research into physical education and sports. While its activities are, naturally, evident in the Keio classroom, the Institute also aims to enhance a broad appreciation for the importance of health and sports among students, faculty and, in particular, Hiyoshi community residents. This enhanced appreciation is pursued through symposiums, public lectures, and seminars.



*Construction of combined wing (Fujiyama Memorial Hall)*

In 2005, the enactment of a comprehensive exchange agreement between Keio University and Yonsei University in Korea provided an opportunity for the Institute to sponsor a symposium titled, "The Sports of Japan and Korea, and Japanese-Korean Soccer." The symposium was designed to encourage enthusiastic university interaction in physical education within the liberal arts tradition. Keio University benefited from an impressive discussion among a number of well-known invited guests, who are famous in the Japan-Korea sports field, along with Keio graduates.

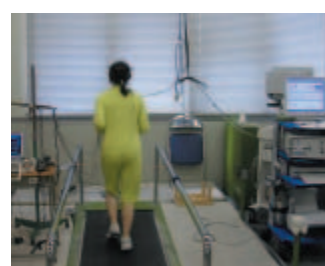
From 2005, the Institute has continued to develop "The Road to a Nice Body" project. This project will provide estimates of student physical characteristics and abilities. It will then offer exercise physiology feedback on topics of interest, such as muscle density and strength, body fat volume in certain areas, and posture stability at rest. The same data will provide the basis for the Institute to offer students detailed guidance on appropriate exercises given their individual, unique abilities.

The Institute continues to support a wide range of physical education and sports science research. These activities include biomechanical analysis of athletic performance, specification of the physical activity mechanics that contribute to mental and physical development and health, and, in the spirit of its founding, physical education instructional theory.

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

## Sports Medicine Research Center

Founded at the Hiyoshi campus in 1988, the Sports Medicine Research Center conducts research and clinical studies in sports medicine and science with a central focus on health. For studies commissioned by industry, the Center regularly conducts collaborative research with the School of Medicine and the Faculty of Science and Technology. Joint research is now being conducted on functional sportswear and on human ergonomics. The joint research on functional sportswear, begun in April 2004 and commissioned for three years, has produced high-functional wear that went on sale from June 2005; research on higher value-added wear is continuing. Clinical studies are also being conducted on evaluating amounts of physical activity and the prevention of lifestyle-related diseases. Guidelines for appropriate activities have been developed.



*Testing in progress for research on functional sportswear*

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

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

## Health Center

The Health Center is a medical research center that performs studies concerning the support and improvement of daily health for Keio students from elementary school to postgraduate school, and for school staff.



*Health Center reception window (in Hiyoshi campus)*

For pupils under 15 years of age, full-time pediatricians perform clinical research concerning growth, obesity, anorexia nervosa, infectious diseases, and the prevention of future lifestyle-related diseases, sudden deaths, etc. We presented our findings on anorexia nervosa in an international symposium for school care programs held in Tokyo. For students from 16 years of age onward and for school staff, full-time internists perform research using annual checkups. For lifestyle-related diseases, clinical studies are mainly performed on the genotypes relevant to a disease, metabolic syndromes, hypertension, diabetes mellitus, bone metabolism, and steatosis (fatty liver). We are also examining effective methods for the prohibition of smoking. We presented our data at many international meetings including the American Society of Hypertension, the European Society of Hypertension, the American Diabetes Association, and the International Health Evaluation and Promotion Association. On the mental health side, full-time psychiatrists conduct awareness polls about psychiatric disorders and investigate maladjustment problems.

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

## The Keio Research Center for the Liberal Arts

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



*Symposium at HRP 2005*

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

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

[http://www.hc.keio.ac.jp/lib-arts/center/pamphlet\\_en.pdf](http://www.hc.keio.ac.jp/lib-arts/center/pamphlet_en.pdf)

## Other Journals (in Japanese)

## Journals Issued by Faculties and Academic Associations on Mita Campus

*Shigaku (The Historical Science)*  
*Philosophy*  
*A Literary Magazine Mita Bungaku*  
*Library and Information Science*  
*Journal of Arts and Letters*

*Mita Journal of Economics*  
*Keio Economic Studies*

*Journal of Law*  
*Kyoyo-Ronso (Journal of Liberal Arts, Faculty of Law)*  
(supplementary volume of Journal of Law)  
*Keio Law Review*  
*Keio Journal of Politics*  
*Journal of Law and Political Studies*

*Studies in Sociology, Psychology and Education*

*BC Mita Business Review*  
*Keio Business Review*

## Hiyoshi Review

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

## Keio Research Center for Foreign Language Education

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



*Keio Research Center for Foreign Language Education: Lecture designed by the Center*

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

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

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

## Hiyoshi Research Portfolio 2005

Hiyoshi Research Portfolio (HRP) 2005, whose mission was to create a meeting ground for connecting the university and society so as to exchange and produce new values and new "scientia," was held at the Hiyoshi Campus on December 20th and 21st, 2005. There were more than 60 poster sessions by research groups or individual researchers, and various symposia and workshops were organized in which many participants took part. HRP's goal of returning new knowledge and discoveries to society, and of establishing a new network with society by promoting within and without Keio University the multi-lateral and cross-disciplinary academic activities conducted at the Hiyoshi Campus, will give a big impetus to the role of the university.



*HRP2005 venue*

## Graduate School of Business Administration

The Graduate School of Business Administration hosts several research projects. For example, in 2005 faculty members conducted research on "Holistic Analysis of Strategic Decision-Making." Other faculty researches include a study of the quality of medical treatments, which was sponsored by the Ministry of Health, Labour and Welfare; and research on "Corporate Strategies of Enterprises in an Era of Technological Innovation," sponsored by the New Energy and Industrial Technology Development Organization (NEDO). For research commissioned by the Mitsubishi Research Institute, Inc. we also developed teaching material using the case method for the development of teachers of management of technology (MOT) nationwide.

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

*The Graduate School of Business Administration: Results of research into teaching by case method.*





Research Centers

## Yagami Campus

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

For Inquiries:

**Secretariat of the KLL**  
(c/o Office of Research Administration, Yagami Campus)  
TEL: +81-45-566-1470  
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 is located at the Yagami Campus, where research and education centered on scientific and technological fields are conducted. In accordance with the principle of pursuing "emerging" themes, work on the campus will continue to be more open and multifaceted, in the form of joint studies into various issues in as-yet-unknown interdisciplinary areas that go beyond conventional fields of specialization. Our mission is to foster human resources; to have researchers not only study the leading edge, but also open it up for themselves and become leaders of society. <http://www.st.keio.ac.jp/english/index.html>



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

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



Here is an introduction to the activities of the KLL.

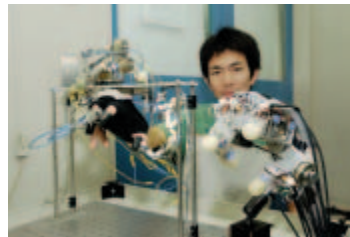
### Activities of the KLL

#### Coordination for Research Work

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

#### Fostering Young Researchers

In order to foster outstanding researchers in science and technology, the KLL offers research aid in the form of Research Grants for Doctoral Program, which assist research activities performed by doctoral students. In FY2005, the KLL extended grants of ¥300,000 each to 111 students, thereby financially assisting the start of research activities by the students as bona fide researchers.



#### Promotion of Research Activities

With the objective of focusing on the development of "germinating" research areas that are expected to be important to society in the future, the KLL calls for research projects ("KLL Specified Research Projects"), and advances research aggressively and systematically in terms of both finances and research space. In order to more vigorously advance general research projects that have been established, "KLL Research Space" is loaned on a fee-paid basis. There is usable space in the *Sousoukan* of the Yagami Campus (a total of 2,519m<sup>2</sup> available; see page32), as well as on the Shin-Kawasaki Town Campus. Furthermore, researchers from corporations and elsewhere outside of the University who participate in research are granted the status of "Researcher of KLL." They are able to perform research activities smoothly at Keio by, for example, utilizing the Information and Media Center for Science and Technology (library).

#### Returning of Research Achievements to Society

Every December, the KLL holds the Keio Techno-Mall, an exhibition aimed at corporate managers. The exhibition introduces research achievements and explores ways to generate new businesses. In 2005, there were 68 booths introducing research achievements and over 1,200 attendees. (The Keio Techno-Mall 2006 is scheduled for 1 December 2006 at the Tokyo International Forum in Yurakucho.) In cooperation with the Intellectual Property Center, the event supports the patenting and commercialization of research achievements and fulfills the cycle of intellectual creation by returning the achievements to society.

## KLL Specified Research Projects (FY2005)

### Started in FY2003

"Studies on Regulatory Mechanism of Growth Factor Receptor Expression and Their Application for Genome-based Drug Discovery"  
Professor Masaya Imoto  
Fundamental Science and Technology

"Countermeasures on Heat Island by the Development of Urban Regeneration"  
Professor Shuzo Murakami  
Science for Open and Environmental Systems

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

"Simulation Method for Prediction of Explosion Damage"  
Associate Professor Akiko Matsuo  
Science for Open and Environmental Systems

"Optical Detection of a Single Pair of Charge-transfer Molecules for Angstrom Resolution Bioimaging"  
Associate Professor Toshiharu Saiki  
Integrated Design Engineering

"Development of the Next Generation of Microfluidic Device for Selective Separation of Specific Material"  
Associate Professor Yohei Sato  
Integrated Design Engineering

"Development of a Bacteria-based Computer and its Application to Gene Analyses"  
Professor Yasubumi Sakakibara  
Fundamental Science and Technology

### Started in FY2005 (Research to Explore Next-generation Cutting-edge Areas: One-Year Projects)

"Fundamental Studies on Self-Assembling Soft Materials Targeting Nano-Functional Biosystem"  
Assistant Professor Atsushi Hotta  
Science for Open and Environmental Systems

"MEMS-based Human Interface Devices"  
Assistant Professor Norihisa Miki  
Integrated Design Engineering

"Effective Third-Harmonic Generation of All-Solid-State Continuous-Wave Lasers"  
Assistant Professor Taro Hasegawa  
Fundamental Science and Technology

"Development of a New Protocol for Self-Assembly of Transition Metal Complexes by Means of Specific Hydrogen Bonding and Its Application in Organic Synthesis"  
Professor Fumitoshi Kakiuchi  
Fundamental Science and Technology

"Modeling of Wrap-Reinforced Structure"  
Assistant Professor Masayuki Kohiyama  
Science for Open and Environmental Systems

"Development on Autonomous Robot for Precision Operating in Open Environment"  
Instructor Masaki Takahashi  
Science for Open and Environmental Systems

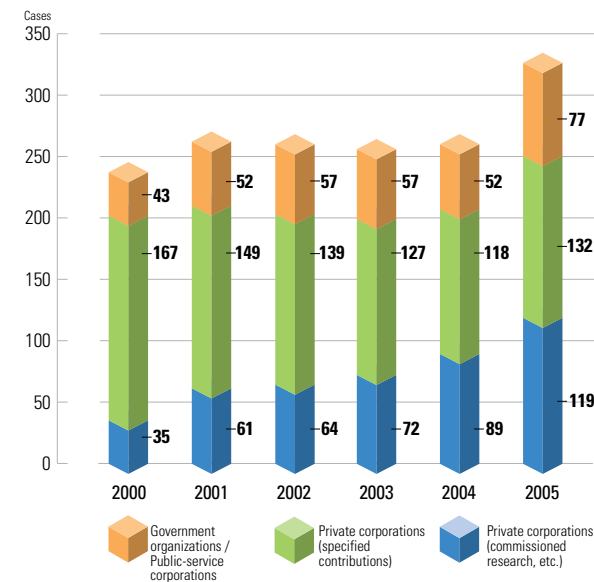
"Development of Perfect Classified Communication against New Threats"  
Assistant Professor Hiroaki Nishi  
Integrated Design Engineering

"A New Visualization Technique for Membrane Potentials in Human Motoneurons"  
Instructor Junichi Ushiba  
Fundamental Science and Technology

"Development of Novel Host Defense Proteins by Evolutionary Genomics"  
Instructor Kohji Hotta  
Fundamental Science and Technology

"Local Distribution Analysis of Nanometer-Sized Glycocluster in Biomembrane"  
Instructor Teruhiko Matsubara  
Fundamental Science and Technology

## Number of Commissioned Research and Other Cases Received (FY2000–FY2005)



## KEIO TECHNO-MALL 2005



Researchers discussing their work with guests



TECHNO-MALL in progress

## Commissioned Research Projects (excerpt)

"Training Program for System Biologists in Keio University"  
Ministry of Education, Culture, Sports, Science and Technology (MEXT)  
Professor Kotaro Oka  
Fundamental Science and Technology

"A Study on Inter-Chip Communications by Using Inductive-Coupling Channel"  
Japan Science and Technology Agency  
Professor Tadahiro Kuroda  
Integrated Design Engineering

"Highly Dependable Software for Capturing Environmental Information"  
MEXT  
Professor Shinji Ozawa  
Science for Open and Environmental Systems

"A Large-Scale Analysis of Transcription Factor Complexes by *In Vitro* Virus Method"  
MEXT  
Professor Hiroshi Yanagawa  
Fundamental Science and Technology

"Development and Practical Implementation of Multianalyte Sensing Systems for Medical, Food and Environmental Analysis"  
Japan Science and Technology Agency  
Professor Koji Suzuki  
Integrated Design Engineering

"Basic and Leading-edge Research on AHS Technology and Evaluation Methodology for Introduction of ITS"  
National Institute for Land and Infrastructure Management  
Professor Hironao Kawashima  
Science for Open and Environmental Systems



Research Centers

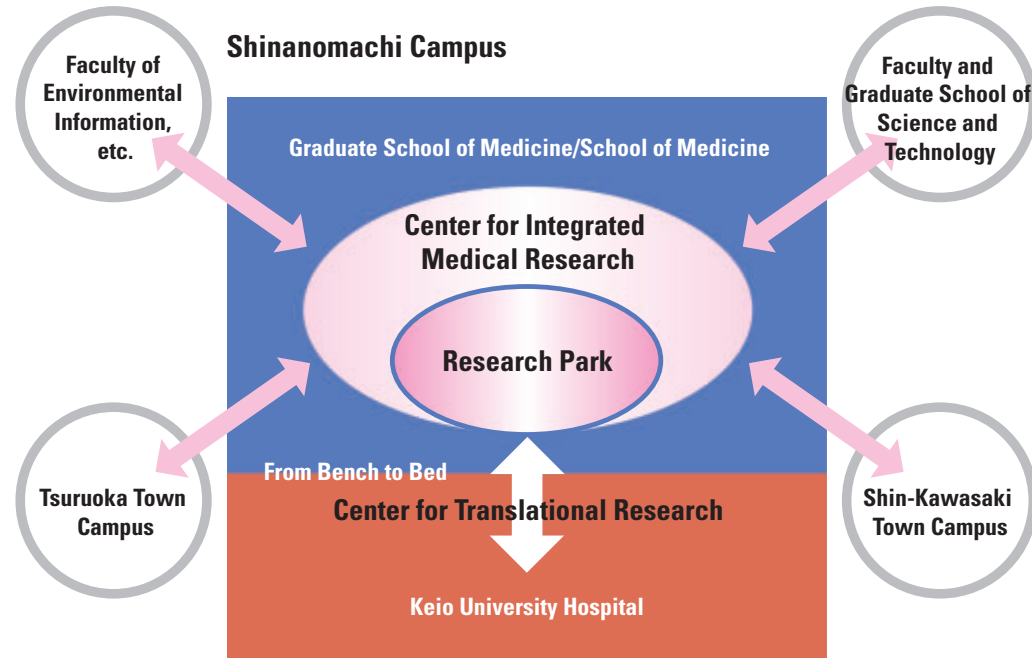
**Shinanomachi Campus**

**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  
 http://www.med.keio.ac.jp/research/index.html

**Keio University Medical Science Fund**  
 TEL: +81-3-5363-3609  
 E-mail:ku-msf@adst.keio.ac.jp  
 http://www.ms-fund.keio.ac.jp/index\_jp.htm



Seminar



Research Park



University Hospital

The Shinanomachi Campus houses the School of Medicine (for 2nd-year students and above), the Faculty of Nursing and Medical Care (3rd-year students), the Graduate School of Medicine, and the University Hospital. It contributes to society through education, research, and treatment. The Center for Integrated Medical Research, located on campus, is a Research Park to advance research in the life

sciences. The Center for Integrated Medical Research advances unified strategic research by researchers from a variety of biomedical departments and agencies who gather to pursue common goals.

**Major Research Projects**

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

“Development of Immunotherapy by Intratumoral Administration of Dendritic Cells”  
 Professor Yutaka Kawakami, Institute for Advanced Medical Research

“Leading Project for Biosimulation”  
 “Development and Application of Computer-based Biosimulation Assisted by Metabolome Analyses”  
 Professor Makoto Suematsu, Biochemistry

“Development of Stem Cell Therapy for Spinal Cord Injuries”  
 Professor Hideyuki Okano, Physiology

“Control of the Stem Cell Niche and Clinical Application”  
 Professor Toshio Suda, Cell Differentiation

**New Energy and Industrial Technology Development Organization (NEDO)**

“Clinical Extension of Technologies for Gas-mediated Manipulation of Macromolecular Functions”  
 Professor Makoto Suematsu, Biochemistry

“Establishment of regenerative therapy using peripheral blood monocytes”  
 Assistant Professor Masataka Kuwana, Internal Medicine

**National Institute of Biomedical Innovation (NIBIO)**

“Development of the Regenerative Cardiomyocytes from Human and Simian Embryonic Stem Cells”  
 Professor Keiichi Fukuda, Regenerative Medicine

**Pharmaceuticals and Medical Devices Agency**

“Research on Treatment of Severe Diseases or Impediments Caused by Drug Side-Effects”  
 Professor Kazuo Tsubota, Ophthalmology

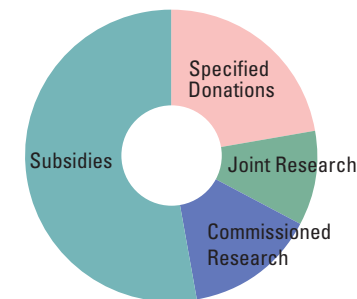
**Endowed Laboratories in the School of Medicine and Graduate School of Medicine**

- Advanced Cardiac Therapeutics
- Oriental Medicine
- Pfizer Growth and Development
- Bridgestone Laboratory of Developmental and Regenerative Neurobiology

(New course from FY2006)

- JMM Musculoskeletal Reconstruction and Regeneration Surgery
- Center for the Study of Chronic Liver Diseases
- Johnson & Johnson Ocular Surface and Visual Optics
- Inaida Laboratory for Anti-aging Medicine

**Outside Research Funds at Shinanomachi Campus**



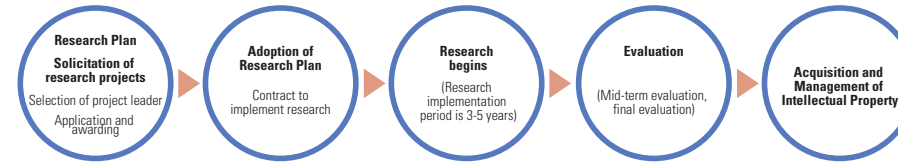
(All yen amounts in thousands)

Specified Donations	1,383,962
Joint Research	650,726
Commissioned Research	897,805
Subsidies	3,282,653
<b>Total</b>	<b>6,215,146</b>

**Shinanomachi Research Park**

The Research Park provides 55 laboratory spaces called units for joint research projects between industry, government, and academia. Durations of the research projects vary from three to five years.

**Schematic of Research Park for Participants**



**Criteria for Participation:**

A project leader applicant to the Research Park may be either a faculty member affiliated with the Keio University School of Medicine or a researcher of another university, research institution, or corporation, but a faculty member of Keio should be included as a responsible official in the project team in the case that the leader is from outside Keio.

**Contract:**

Based on the decisions of the evaluations committee at the Center for Integrated Medical Research, the participating projects are decided and collaborative contract is made between companies or research representatives and Keio University.

The project leader or corporations sign a joint research contract with Keio University.

The Evaluation Committee evaluates each project at the end of the second year and upon completion of the research in the final year.

All costs related to the research project from moving in to removal upon completion—for facilities, equipment, plumbing work, utilities, and general administration costs and expenses—are born by the project leader (usually paid from common research fees).

**Research Results:**

The Intellectual Property Center (IPC) at Keio University offers advisory services to researchers regarding acquisition of intellectual property rights and technology transfer.

**Research field of School of Medicine available at:**  
[http://www.cimr.med.keio.ac.jp/ichiran\\_e.htm](http://www.cimr.med.keio.ac.jp/ichiran_e.htm)

**Joint Research Projects**

**Otsuka Pharmaceutical Co., Ltd.**  
 “Foundational Assessment of the Development of New Therapeutic Methods for Digestive Disorders”

**Ajinomoto Co., Inc.**  
 “Pharmacological Effects of Amino Acids on Chron’s Disease and Analysis of Change in Metabolic Balance of Amino Acids during Disease State”

**CANON Inc.**  
 “Development of DNA chip and its Application”

**Sankyo Co., Ltd.**  
 “Therapeutic Strategy for Prevention/ Progression of Metabolic Syndrome and Methodology of its Clinical Application”

**Mitsubishi Pharma Corporation**  
 “Development of Platelet Substitutes”

**Daiichi Pharmaceutical Co., Ltd.**  
 “Keio University-Daiichi Pharmaceutical Research Project on Thrombosis Genetics”

**Kowa Company, Ltd.**  
 “Elucidation of Mechanism and Investigation of Treatment for Sjögren Syndrome”

**Toshiba Corporation**  
 “Non-invasive Radiology System for the Diagnosis and Therapy of Cancer”

**Chugai Pharmaceutical Co., Ltd.**  
 “Development of Novel Therapy for Hematological Malignancies”

**Astellas Pharma Inc.**  
 “Vascular Medicine Project”

**GE Yokogawa Medical Systems Ltd.**  
 “Development of Novel Systematic Diagnosis with MDCT and MRI in Cardiovascular System”

**Roche Diagnostics K.K.**  
 “Development of Rapid and Quantitative Detection Method of Micrometastasis in Lymph node Bases on Sentinel node Concept”

**Hitachi, Ltd.**  
 “Development of the Surgical Robot with Haptic Feed Back”

**Shinanomachi Research Park**  
<http://www.rpk.med.keio.ac.jp/>

**Keio University Medical Science Fund**

**Establishment of the Fund**

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

To continue Keio University’s reputation built by the achievements of its forebears, the Fund will be used to contribute more deeply to the welfare of human society by nurturing and exchanging world-class human resources not only within the University, but also internationally in the fields of medical research, in the spirit of the achievements of trailblazing standard-bearers Yuichi Fukuzawa and medical pioneer Shibusaburo Kitasato.

The main activities of the Fund are to administer the Keio Medical Science Prize and the Mitsunada Sakaguchi Memorial Laboratories.

**Keio Medical Science Prize**

The Keio Medical Science Prize is awarded to researchers in recognition of their outstanding achievements in the fields of medical or life sciences. No consideration is given to nationality.

The Keio Medical Science Prize consists of a certificate of merit, a medal and a monetary award of 20 million yen. The award ceremony and commemorative events are held at Keio University in the presence of invited guests.



Award medal

**Mitsunada Sakaguchi Memorial Laboratories**

The School of Medicine currently has two programs titled ‘Developmental Biology Laboratory’ and ‘Regenerative Medicine and Advanced Cardiac Therapeutics’, both of which are run under the Keio University Medical Science Fund. We aim to promote, through these programs, education and research which swiftly respond to the needs and various changes of the society.

**Developmental Biology Laboratory**

Professor Toshio Suda  
 The focus of the research in our laboratory is to understand the properties of stem cells. Hematopoietic stem cells can be defined as cells that have the capacity for both self-renewal and differentiation into all blood cell types. We have analyzed the mechanisms of stem cell systems at the molecular level and cell/tissue level. This basic research is directly linked to issues in clinical medicine, such as tissue regeneration and repair.

**Regenerative Medicine and Advanced Cardiac Therapeutics Laboratory**

Professor Keiichi Fukuda  
 The goal of the research in our laboratory is to develop regenerated cardiomyocytes and establish cell transplantation therapy for the patients with severe congestive heart failure. Heart transplantation is the ultimate therapy for the treatment of severe heart failure, but the inadequate supply of donor hearts is a major problem. We promote basic research of the stem cell science and tissue engineering of the heart using developmental and molecular biology and gene modified mouse, and examine the translational research for the clinical application.

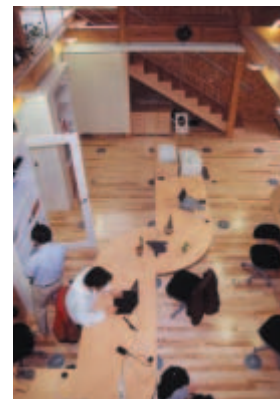
## Shonan Fujisawa Campus



## SFC

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

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



## Research Centers

## Shonan Fujisawa Campus (SFC)

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

## Keio Research Institute at SFC

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

As a leading center of cutting-edge research in the 21st century, the Institute works to further enhance society's advancement by performing ground-breaking research based on interdisciplinary cooperation and by nurturing a two-way partnership between educational and research activities at the campus. This includes all related activities with industry, government, and academia both in Japan and overseas. Specific measures to achieve this include promoting joint research projects with other organizations and supporting venture incubation efforts. One of the unique aspects of the Keio Research Institute at SFC is its SFC Research Consortium, which encourages university-led collaborative research by multiple organizations. There are currently 16 such projects underway (as of June 2006).

Additionally, the Institute was commissioned with 190 funded research projects amounting to approximately ¥1.8 billion from government agencies, local governments, and private companies in FY2005.

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

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

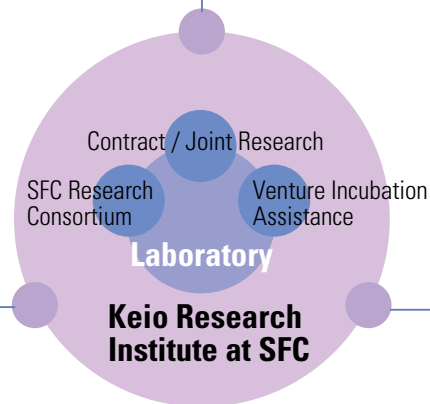
Number of researchers: (as of 23 June 2006)  
Full-time staff: 253  
Researchers appointed with external funding: 108  
Visiting Researchers: 335  
Total: 696



SFC Open Research Forum 2005

## For Inquiries and Document Requests:

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



## Making Research Achievements Available to the Public

## SFC Open Research Forum (ORF)

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

<http://orf.sfc.keio.ac.jp/> (in Japanese)

## Laboratory

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

Currently, the following 12 laboratories are in operation:

- Career Resource Laboratory
- Internet Research Laboratory
- Geo-informatics Laboratory
- Digital Cinema Laboratory
- Bioinformatics Laboratory
- Auto-ID Laboratory
- Ubiquitous Computing & Communication Laboratory
- Platform Design Laboratory
- Healthcare Informatics Research Laboratory
- Keitai Laboratory
- SIV Entrepreneur Laboratory
- Interaction Design Laboratory  
<http://www.kri.sfc.keio.ac.jp/english/laboratory/laboratory.html>



## Returning Research Achievements to Society

## SFC Forum

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

<http://www.sfc.keio.ac.jp/sfc-forum/> (in Japanese)

## Digital Art Awards

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

The Digital Art Awards 2006 (DAA 2006), presented by Keio Research Institute at SFC, is designed to encourage, support, and promote digital content produced by creative students. The competition aims to become an international gateway to success for students who will lead the next generation digital content industry. The sixth annual competition is currently inviting innovative and experimental digital works in four categories: "Digital cinema," "Interactive," "Digital Music" and "High School Students." Winners of the Digital Art Awards 2006 are presented with their awards at the Open Research Forum (ORF).

## World-Leading Fusion Research Technology

## SFC Research Consortium

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

Currently, the following 16 consortium projects have been organized:

- Building Conceptual Media and Application Systems
- VCOM
- Research on Advanced Next-generation Internet Architecture
- Building Advanced Information Infrastructure
- VSI (Virtual Systems Institute)
- Sharing Human Intellect Project
- SFC Venture Form
- Research Project on Urban Computerization and Public Space
- E-CELL Consortium
- DVTS (Digital Video Transport System) Consortium
- SFC "Design Museum Factory" Consortium
- DMNET (Digital Media Learning NETWORK)
- e-Care Consortium
- SIV Entrepreneur Education Research Consortium
- Interaction Design Research Consortium
- Ubiquitous Cinema Consortium  
<http://www.kri.sfc.keio.ac.jp/english/research/consortium.html>

## Case Studies

**Interaction Design Laboratory**  
Professor Michiaki Yasumura  
Faculty of Environmental Information

In the last decade of the twenty-first century, the way human beings and computers interact has altered dramatically. We have moved from personal computers to a ubiquitous computing environment. Indeed, computers are now used in heterogeneous places ranging from offices and schools to homes and airplanes. The new and ubiquitous man-machine interface requires a comprehensive methodology that 'interaction design' supplies. With this view in mind the Interaction Design Laboratory was created.

The Laboratory therefore generates new concepts and designs of computers that allows better user interface. The guiding principle behind our entire endeavor is to create new artificial design that goes beyond the conventional personal computer to a level where an interactive design supports the whole spectrum human life, including memories, lifestyles, and activities.

**SIV Entrepreneur Laboratory**  
Professor Jiro Kokuryo  
Faculty of Policy Management

The SIV Entrepreneur Laboratory began functioning on April 1, 2005 within the Keio Research Institute at SFC to intensify and diversify the successful research work of the SFC Incubation Village Research Consortium and Venture Support Intensive Project in the area of entrepreneur education, systemization of business incubation knowledge, entrepreneur strategy planning, expansion of venture incubation facility and organizational support from business companies.

The guiding principle behind the establishment of the SIV Entrepreneur Laboratory has been the Keio Research Institute at SFC which has given paramount importance to laboratory based research on specific themes like venture support, environment and information technology. Both laboratory-based research and venture support themes were the motivating ideas behind the establishment of the SFC Incubation Village Research Consortium in April 2002.

As SIV Research Consortium as well as other group of researchers in Keio University SFC continues to expand its venture incubation facilities, the campus welcomes wide-ranging cooperation both with local/overseas universities and business enterprises. For instance, in 2006 a new venture incubation facility will be established at Keio University SFC in collaboration with the Organization for Small & Medium Enterprises and Regional Innovation, Kanagawa Prefecture and Fujisawa City. To further this end an administrative support system has already been established.

## Venture Incubation

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

These facilities are offered for rent at reasonable rates to entrepreneurs who utilize SFC knowledge and information in fields such as IT, biotechnology, environment-conscious technology, nursing and health care, health management, city design, and social system design, and desire to begin a start-up business in alliance with Keio. Public offerings began in November 2005, and 28 organizations were selected based on their wish to utilize knowledge from and ally themselves with Keio University. As organizations move beyond the facilities, new applications will be accepted on an ad-hoc basis.

Keio University hopes that a variety of new businesses will emerge from these facilities, including listed companies active at the global level and community-based social ventures.

At the facilities, a number of incubation managers will be present to assist the businesses through advice and matching suited to their needs.





Research Centers

### Shin-Kawasaki Town Campus

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

For Inquiries:

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

The Shin-Kawasaki Town Campus, popularly known as the 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 the Education Collaborative Square were established as a frontier research organization within Keio University.

This roughly two-hectare site surrounded by greenery houses four two-story research buildings and one welfare building where a total of approximately 380 (as of March 2006) researchers including graduate students, joint researchers, and others work day and night to advance research.

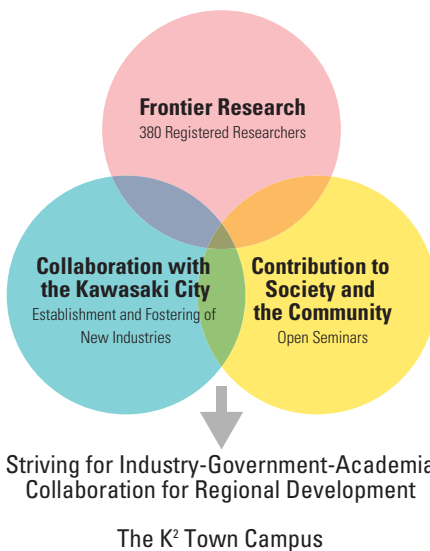
In FY 2005, 14 representative Keio University frontier research projects rooted in industry-government-academia collaboration were carried out. In addition to using frontier research to enhance the technologies of local businesses and cultivate local industry through the generation of new industries, the K<sup>2</sup> Town Campus also held seven open seminars an open campus day, and other events that served to make city residents and young people aware of numerous types of learning centered on science and technology.

### Toward Industry-Government-Academia Collaboration for Regional Development

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

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

The K<sup>2</sup> Town Campus will continue to work as a center for collaboration that is meaningful to both Keio and Kawasaki City.



#### Frontier Research Projects

14 frontier research projects rooted in industry-government-academia collaboration are being carried out across faculties and research courses, with a staff of over 380 researchers (including full-time teachers, joint researchers, and graduate students) working day and night to advance research.

#### Contributing to Society through Frontier Research

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

#### Contributing to Society through Science Education and Awareness Campaigns

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

### Research Projects \* Completed in FY2005 \*\* New Project starting in FY2006

K-Building	<b>Project on Flexible Network for Hard-real-time and Hard-real-world System</b> Kouhei Ohnishi (Professor, Faculty of Science and Technology)
K-Building	<b>Genome-based Drug Discovery Project</b> Masaya Imoto (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>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>Next Generation Broadband Mobile Communication Research Project</b> Masao Nakagawa (Professor, Faculty of Science and Technology) *
K-Building	<b>VISOR Project—Flexible Communication Systems</b> Shinichiro Haruyama (Visiting Professor, Faculty of Science and Technology)
K-Building	<b>Distributed Real-time Processing Project—Distributed Real-time Information Processing for Humanoids</b> Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)
K-Building	<b>NEDO Device Development Project for Next Generation Robot Motion Control Research and Development of System LSI (M-RMTP) for Next Generation Robots</b> Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)

K-Building	<b>Project on Developing High Reliability of Devices with Mechanical Contacts—Toward Highly Reliable RF MEMS Switches and Sliding Contacts</b> Koichiro Sawa (Professor, Faculty of Science and Technology) **
E-Building	<b>ERATO-SORST Koike Photonics Polymer Project—"Fiber to the Display" by High-speed Data Transmission and High-quality Displays</b> Yasuhiro Koike (Professor, Faculty of Science and Technology)
I-Building	<b>Beyond the Human Genome Project DNA Science: Basic Research, Medical Applications and Public Campaign</b> Nobuyoshi Shimizu (Professor, School of Medicine)
O-Building	<b>Future Vehicle Project—Vehicles on the Ground Using the Technology of Drive and Automatic Driving</b> Hiroshi Shimizu (Professor, Faculty of Environmental Information)
O-Building	<b>Next Generation Nano-technology Thin Film Project (Wide Applications of Wet-Process Nano Coating)</b> Seimei Shiratori (Associate Professor, Faculty of Science and Technology)
O-Building	<b>Project for IP-based Wireless Communication Technologies—For a Combination of Cellular and Ad-hoc Networks</b> Masao Nakagawa (Professor, Faculty of Science and Technology) *
O-Building	<b>The WIDE Project—Research on IPv6</b> Jun Murai (Professor, Faculty of Environmental Information)



Test run of an electric car



Seminar in a laboratory



Open seminar



Open seminar

### FY2005 Open Campus (14 Project Exhibits)

On Saturday, 11 November 2005, the Open Campus began with greetings from the vice president and the mayor of Kawasaki City, and was attended by many residents, students, and individuals from businesses, among others.

### FY2005 Open Seminars \*Techno-Juku targeted for junior and senior high school students

DD/MM/YY	Instructor	Topic
12/11/05	Professor Yasuhiro Koike	Plastic Optical Fiber: Creating the Broadband Society*
12/11/05	Professor Hiroshi Shimizu	The Future of Automobiles: The Evolving Electric Car <i>Eliica</i>
19/11/05	Professor Kouhei Ohnishi	The Development of Medical Robots: Collaboration between Engineering and Medicine
19/11/05	Professor Nobuyoshi Shimizu	The Human Blueprint: What is a Genome?*
03/12/05	Associate Professor Seimei Shiratori	Nanotechnology: Making Life More Convenient
03/12/05	Professor Masaya Imoto	The Forefront of Genome-created Drugs
28/01/06	Associate Professor Kiichiro Kobayashi	The Management of Innovation and Technology



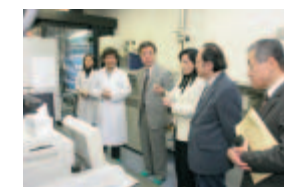
Junior and senior high school students at Open seminar

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 FY2005, a total of seven open seminars and open lectures were held that were attended by many participants. Additionally, numerous seminars are also planned for FY2006.

### The K<sup>2</sup> Corner Starts 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. On the third Tuesday of each month, a researcher of the K<sup>2</sup> Town Campus appears at the studio and introduces frontier research that is currently being advanced.

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 Planning 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



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



### Media Coverage

In FY2005, the Shin-Kawasaki Town Campus (K<sup>2</sup> Town Campus) was reported in 88 newspaper articles (to the best of our knowledge) for events such as the test ride of the electric car *Eliica* by Prime Minister Junichiro Koizumi, as well as for commendations received by researchers.

Mass media such as Television Kanagawa and FM Yokohama also produced special features on the K<sup>2</sup> Town Campus.

### 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 by businesses, organizations, and media to showcase its leading-edge research being pursued daily.

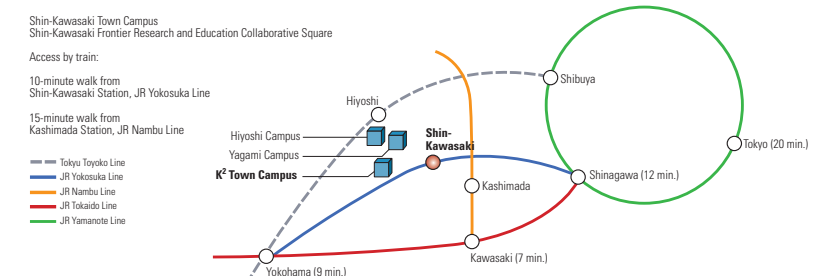
#### Principal Guests in FY2005

- Kanagawa Governor Shigefumi Matsuzawa
- Princess Takamado
- The Kawasaki Chamber of Commerce and Industry Financial Committee
- ASPA (Asian Science Park Association)
- Malaysia: Director of MARA Education Foundation
- France: President of Ecole Centrale Nantes
- Beijing Haidian Science Park: Observation delegation
- China Electric Businesses: Observation delegation

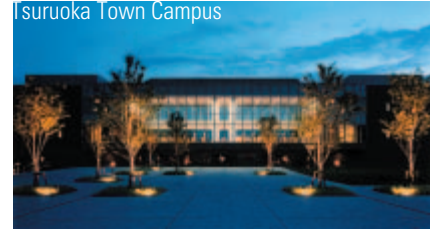
### Kanagawa Shimbun

The column "Campus NOW" 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"?



## Tsuruoka Town Campus



## Research Centers

## Tsuruoka Town Campus

## K-FRECS: Keio Frontier Research &amp; Education Collaborative Square

## For Inquiries:

**Tsuruoka Town Campus**  
**Keio Frontier Research & Education Collaborative Square (K-FRECS) at Tsuruoka**  
 14-1 Baba-cho, Tsuruoka-shi, Yamagata, 997-0035 Japan  
 TEL: +81-235-29-0800 (Main)  
 FAX: +81-235-29-0809  
 E-mail: office@ttck.keio.ac.jp  
<http://www.iab.keio.ac.jp/>



Bio-lab

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

Research at IAB is performed 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.

## Institute for Advanced Biosciences (IAB)

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

The IAB attracts attention of the world as a pioneer of "integrated systems biology," a new IT-driven bioscience.  
<http://www.iab.keio.ac.jp/>

## Major Research Projects

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

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

## 21st Century COE Program

"Understanding and Control of Life's Function via Systems Biology" (2002-2006)

## Ministry of Economy, Trade and Industry (METI)

"Functional RNA Project" (2005-2009)

## Japan Science and Technology Agency (JST)

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

"Methods of Introducing Samples for Mass Spectroscopy Analysis of Omics and Methods of Analysis of Large-Scale Data from Mass Spectroscopy" (2006)

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

## New Energy and Industrial Technology Development Organization (NEDO)

"Development of Fundamental Technologies of Industrial Processes Using Biofunctions: Development of Cellular Modeling Techniques" (2001-2005)

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

"Research on Development of New Medical Treatment Based on Cancer Biology" (2005-2006)

## Yamagata Prefecture and Tsuruoka City

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

## Research System

## Major Joint Research Organizations

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

## Educational Activities

The IAB develops and deploys educational activities for students with different majors in undergraduate or graduate school of Keio University, under the ideal that advanced research and education should be inseparable. In FY2005, 35 students in the spring semester and 32 students in the fall semester participated in the programs and activities offered at TTCK.

## Bio Camp

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

## Bioinformatics Program

The Bioinformatics Program is a rare graduate program in the world in the sense that students can earn credits from both the SFC (bioinformatics) and the TTCK's IAB (systems biology). At the TTCK, a number of experiments and laboratory trainings are provided, such as "metabolome analysis" and "proteome analysis," using the most advanced DNA sequencers, mass spectrometers, etc.

## Events

## Introduction to Bioscience for Tsuruoka Citizens

The introductory bioscience course for general public and taught by researchers of the IAB. There were 93 participants in FY2005.

## Summer Bio College

This is a basic hands-on program in biotechnology aimed at high school students in the Keio's affiliated high schools. There were 19 participants in FY2005.

## Keio Summer Bio Camp

This is a basic hands-on program in biotechnology for any high school students from all over Japan. In FY 2005, 19 students participated.

## The Advanced Biosciences Seminar with Experiments

This seminar is offered for teachers at elementary, junior high, and high schools in Tsuruoka City, who are either science teachers or those interested in biosciences. The seminar utilizes the research equipment of the IAB's Bio-lab and literature at the Chido Library, specializing in areas of natural sciences centered on bioscience. There were 16 participants in FY2005.

## Open Campus 2006

For local residents, a symposium discussing the research done at the Institute for Advanced Biosciences (IAB) and tours of labs were held in August 2006.

## The 1st Metabolome Symposium "The Future of Life Sciences through Metabolomics"

In November 2006, the first domestic academic conference on metabolome will be held. Researchers nationwide will be participated.

## 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 began joint research with Mizkan Group Co. Ltd. in January 2004, Ajinomoto Co., Inc. in June 2004, Mitsubishi Pharma Corporation in February 2005, and Chugai Pharmaceutical Co., Ltd. in September 2005. HMT is headquartered at the Tsuruoka Metabolome Campus.



High-throughput and quantitative CE-MS methods which can measure thousands of charged metabolites

## Other Related Facilities

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



Overall View of Tsuruoka Metabolome Campus



Metabolome Group Research Facility in Tsuruoka Metabolome Campus

## Major Awards

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

June 2003  
 "Nihon Kogyo Shimibunsha 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"



Research Centers  
**Research Institute for Digital Media and Content (DMC Institute)**  
 The "Encouraging Development of Strategic Research Centers" of the Special Coordination Fund for the Promotion of Science and Technology, MEXT

For Inquiries:  
**DMC Institute**  
 c/o KEIO University  
 2F, West Annex, 2-17-22 Mita, Minato-ku, Tokyo  
 108-0073 Japan  
 TEL : +81-3-5418-6432 FAX : +81-3-5418-6437  
 E-mail : info@dmc.keio.ac.jp  
 http://www.dmc.keio.ac.jp/en

The Research Institute for Digital Media and Content (DMC), established in 2004, promotes international research projects under a project-based contract system called a "project system", focusing on contextual digital contents from a variety of angles including: Content Creation, Development of Media Technology, Intellectual Property Management and Content Industry and Policy. In FY2005, DMC also launched new Global Studios as an overseas base at Tsinghua Univ. (China) and Yonsei Univ. (Korea), and held international symposiums to promote the global distribution of our research results.



Studio at Yonsei University



Studio at Tsinghua University



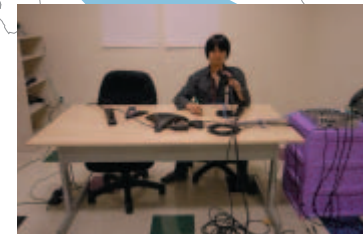
Studio at the University of Cambridge

**The studios are:**

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



Studio at Keio University



Studio in San Francisco



Studio in New York

**Project List**

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

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

**DMC Lab: Five Research Areas**

<p><b>Content Creation</b></p> <ul style="list-style-type: none"> <li>- Art Ensemble Digitization</li> <li>- Resources of Butoh Body Movements</li> <li>- Sound Education</li> <li>- 3D Digital Media Capturing and Presentation</li> </ul>	<p><b>Content Digitalization &amp; Distribution</b></p> <ul style="list-style-type: none"> <li>- Post-Encyclopaedism</li> <li>- Creation of a Remote Collaboration System and State-of-the-Art Digital Content</li> <li>- Re-creation and Archive of 40s Mining Town Using Advanced 3D Computer Graphic Technology</li> <li>- Historical Image Database of Yukichi Fukuzawa at Keio University</li> <li>- Best Practice Guide of e-Learning</li> </ul>	<p><b>Media Environment</b></p> <ul style="list-style-type: none"> <li>- Digital Cinema LyKEION Project</li> <li>- Digital Archives for Architectural Space Project</li> <li>- Research on Ubiquitous Media Infrastructure Technologies and Applications</li> <li>- Content Cruising System</li> </ul>	<p><b>Intellectual Property Management</b></p> <ul style="list-style-type: none"> <li>- Digital Intellectual Property Project</li> <li>- Project for Developing Education Programs for Strategic Standardization</li> </ul>	<p><b>Content Industry &amp; Policy Research Project</b></p> <ul style="list-style-type: none"> <li>- Content Industries &amp; Policy Research Project</li> </ul>
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In order to promote integrated research related to digital media and content, DMC has established five research areas at the DMC Lab : ( I Content Creation, II Content Digitalization & Distribution, III Media Environment, IV Intellectual Property Management, V Content Industry & Policy)

Examples of main DMC projects are as follows:

**LyKEION Project**

This project aims to make a broad contribution to society by establishing a technical base and new methods for use of next-generation digital content, based on super high-quality digital imagery technologies. This project will also contribute to the accumulation and delivery of digital content at DMC and to the development of expert personnel who will sustain the new content industry. In addition, this project features joint research with research laboratories and other related organizations in Japan and around the world.

The project is divided into the following four areas:

- (1) Digital Cinema Project: Establishing evaluation methods and securing content delivery and film restoration technologies in collaboration with Hollywood and other professional communities
- (2) Archiving technologies: Permanent storage formatting and system prototyping
- (3) High-speed digitizing technology: Automatic digital restoration and high-speed film scanner prototyping
- (4) Content creation, collection and evaluation: Vintage film collection, digital archiving, and evaluation of new communication tools.

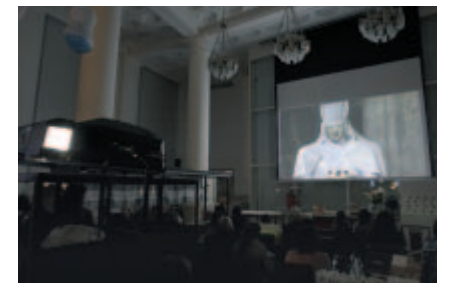
2005.4.13	Press Conference, "The world's first permanent experimental facility for digital cinema installed at the West Annex of KEIO Mita Campus"
2005.6.1	Workshop, "DMC Workshop on Digital Cinema-New Directions in Digital Cinema Technology-"
2005.7.21	DMC Lecture, "The Latest Trends of European Digital Cinema-WorldScreen and CineVision 2006"
2005.9.27	Participation in an international networking conference, iGrid 2005
2005.10.25	DMC Lecture, Richard Edlund, "Digital Cinema"
2006.3.11,12,15	Noh Performance and 4K Digital Cinema BankART 1929 YOKOHAMA



DMC Lectures



iGrid 2005



4K Digital Cinema

**Content Industries & Policy Research Project**

With the rapid development of an information society in recent years, the digital content industry has been attracting much attention from policy makers worldwide. However, it has been pointed out that there is no solid knowledge base for policy proposals and planning regarding digital content. The mission of our project is to construct a theoretical framework for digital content from an interdisciplinary perspective, and to create an Industry-Government-University open research platform for policy discussion regarding digital content. Since its start in October 2005, this project has mainly focused on the following three activities:

- (1) Industry-Government-University Research Collaboration
- (2) Global Policy Collaboration
- (3) Research, Policy Recommendation & Education

2005.12.6	The 1st Creative Industry and Policy Forum –Music Business in the Net Age
2006.1.26	The 2nd Creative Industry and Policy Forum
2006.2.10	The 1st Creative Industry and Policy Seminar
2006.3.10	The Japan-Korea Media Convergence Policy Symposium
2006.3.16	The 2nd Creative Industry and Policy Seminar

Organization (as of March 31, 2005)	
Researchers	46
Cooperating personnel at Keio	33
Temporary Researchers	23
Research Assistants	38



Creative Industry and Policy Forum



The Japan-Korea Media Convergence Policy Symposium

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

The Center for Research Promotion utilizes the broad-ranging research capabilities of Keio University to plan and promote comprehensive research activities that transcend the boundaries of existing organizations and faculties, for example through interactions in differing fields.

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

### Goal of the Programs

Many existing research funding programs examine past research results in the field in question. As a result, particularly when a young researcher attempts to open up a new field, there are no corresponding past research results, so that researcher will face the problem of being unable to obtain funding when s/he needs it most: when starting up new research.

Similarly, when conducting research that involves more than one field, it may be difficult to apply for public funding if preliminary results are not available. Furthermore, when researchers in several different fields try to joint-research, even though they want to develop new research directions through collaborations that are not an extension of any one of their original fields, they may have to abandon their research for lack of funding.

### Selected Researchers and Research Subjects in 2005 (titles at time of selection)

Grant for New and Young Researchers		
Name	Affiliation/position	Subject of Research
Junichi Ushiba	Instructor, Department of Biosciences and Informatics, Faculty of Science and Technology	Development of a communication device inspired by neural signal transmissions
Toshihiko Oka	Instructor, Department of Physics, Faculty of Science and Technology	Making a large single crystal of a photo-sensitive membrane protein for a neutron diffraction experiment
Yasuhiro Kakinuma	Instructor, Department of System Design Engineering, Faculty of Science and Technology	Application of Electro-rheological Gel to Fixtures and Micro Alignment Systems for Thin Glass Plates
Yoko Saikawa	Instructor, Department of Applied Chemistry, Faculty of Science and Technology	Chemical Studies on Natural Pigments as Functional Molecules
Takuya Satomura	Associate Professor, Faculty of Business and Commerce	A Simultaneous Model of Determination of Pricing: An Empirical Approach
Motoaki Sano	Instructor, Department of Regenerative Medicine, School of Medicine	The Role of HEXIM-1 in Cardiac Hypertrophy and Remodeling
Yasunari Takada	Instructor, Department of Microbiology and Immunology, School of Medicine	The mechanism of cell density-regulated transcription factor NF- $\kappa$ B activation
Toshiyasu Nakamura	Assistant Professor, Department of Orthopedic Surgery, School of Medicine	Diffusion MRI of denervated skeletal muscle for early diagnosis of peripheral nerve injury
Taro Hasegawa	Assistant Professor, Department of Physics, Faculty of Science and Technology	Laser cooling of doubly-charged lanthanum ions for implementation of quantum computers
Masanori Hirashima	Instructor, Department of Cell Differentiation, School of Medicine	Role for somite-derived endothelial cells in vascular development
Atsushi Hotta	Assistant Professor, Department of Mechanical Engineering, Faculty of Science and Technology	Mechanical properties, fracture surface and material recycling on the composite of polymers and amorphous carbon
Kohji Hotta	Instructor, Department of Biosciences and Informatics, Faculty of Science and Technology	Construction of 3-D database for embryonic development of chordate animals
Hideyuki Maki	Instructor, Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology	Carrier control of carbon nanotubes with the electric field and strain for the light emitting devices
Shinji Matsuda	Instructor, Department of Physiology, School of Medicine	Molecular mechanism for protein sorting to the postsynaptic spines
Norihisa Miki	Assistant Professor, Department of Mechanical Engineering, Faculty of Science and Technology	Collagen-mixed Polymeric Material for a Microreactor with High Bioaffinity

Differing Fields Collaboration		
Name of research representative	Affiliation/position	Subject of Research
Kazunori Nakajima	Professor, Department of Anatomy, School of Medicine	Mechanism of cortical development

In order to overcome these problems even to a small degree, and to increase the potential for research at Keio University, the Center for Research Promotion established two in-house grant programs in 2005: The "Grant for New and Young Researchers" and the "Differing Fields Collaboration Grant."

### Details of the Grant Programs

Following is an outline of the conditions for applications for the Research Grant Programs.

### Grant for New and Young Researchers

1. The research must be creative and offer possibilities for the future.
2. On April 1 of the year of the application, the applicant must be 40 years of age or younger, or have been with Keio University for five years or less, and must be a full-time researcher, a non-tenured

- contract researcher, or a special researcher (if qualified to apply for external funding).
3. Maximum research expenses per project is one million yen

### Differing Fields Collaboration Grant

1. Two or more researchers must be participating from different specialized fields
2. Project must be comprehensive, taking advantage of collaborations between different fields, and must be creative and offer possibilities for the future.
3. Maximum research expenses per project is five million yen

In either case, the funding is positioned as an initial investment and preparation funding for opening up new fields, so as a next step, the researcher (or the research representative) is required to further develop the research results, and apply for external research funding (e.g., subsidies for scientific research expenses or other competitive research funding) in relation to the granted research in the following year.

After screening by the Selection Committee, the researchers that submitted the selected applications are provided with grants for research expenses. The researchers are required to conduct the research during the year in which the grant is provided, and to present the results of that research at a research seminar held at the beginning of the following year. At the same time, they are required to announce their plans for acquisition of external research funding in the next year.

During the 2005 fiscal year, there were 42 applications, of which 15 were selected for the Grant for New and Young Researchers and one for the Differing Fields Collaboration Grant. The table below shows the names and subjects selected in 2005.



Research Presentations

## 2 Bio-information Medical and Engineering Forum

The Bio-information Medical and Engineering Forum was initiated in December 2005 to promote new interactions among researchers in the Keio University School of Medicine and the Faculty of Science and Technology, to foster young researchers, to provide opportunities to present research results, and to encourage new developments in the integration of research fields.

At the level of individual researchers, there have always been extensive interactions between researchers in the School of Medicine and the Faculty of Science and Technology. This Forum respects those individual interactions, while at the same time providing a new venue intended to encourage new collaborations related to medical and engineering activities at Keio University. Concrete results are already beginning to appear. To give one example, the researchers who participated in the Forum came to the

realization that listening to presentations on research by the various lecturers provides supplemental materials for their own research. In some cases, these researchers conducted detailed discussions later, decided on specific themes, and jointly applied for Keio's internal research grants.

The Forum was supervised by Prof. Makoto Suematsu of



Assistant Prof. Kitagawa gives a presentation

the School of Medicine (Medical Chemistry) and Prof. Kotaro Oka of the Faculty of Science and Technology (Department of Biosciences and Informatics). Based on an awareness that it is most effective to conduct this type of research meeting close to a clinical environment in a hospital, as a rule the Forum will be held once every two to three months in the lounge of the General Medical Sciences Research Building on Shinanomachi



Researchers listen intently to the presentations

Campus. Following presentations by researchers in the School of Medicine and the Faculty of Science and Technology, a social gathering is held for the participants, in the hopes of planting the seeds for new interactions among the researchers.

Starting with the 2nd Forum in April 2006, the proceedings will be provided via a remote broadcast from the venue in Shinanomachi for Faculty of Science and Technology researchers who are unable to travel to Shinanomachi.

Through this Forum, we expect to see even further vitalization of research interactions in fields related to medicine and engineering at Keio University.

## 3 Transmission of Research Activities to Society

The Center for Research Promotion conducts public symposia twice each year at the Mita Campus as a form of outreach for research activities (comprising efforts to educate members of society and promote proliferation of research results). The intent of these symposia is to show a broader segment of society the day-to-day research activities undertaken at the University in a multi-faceted, three-dimensional format. The symposia held by the Center for Research Promotion are not like the research seminars conducted in specified academic fields. One of the unique characteristics is that knowledgeable individuals from outside the university participate in exchanging ideas on a common theme; for example, participants might include researchers in different academic fields or representatives of companies with deep connections to the theme in question. In addition to lectures, debates, and occasionally booth exhibits and demonstrations, the same theme might be examined from the perspective of completely different research fields, or from the dual perspectives of "Universities" and "Society."

At the "21st Century Brain Science Frontier" Symposium held in February 2006, researchers from inside and outside Keio University in the fields of medicine, bio-information sciences, and psychology gathered along with a top executive from a pharmaceutical company for lectures and a panel discussion on the theme of "Brain Sciences." The proceedings included an introduction to the current status of brain science research in three fields, and discussions on its possibilities in the 21st century. This Symposium was also jointly sponsored by three Keio University Centers in the 21st Century COE Program. At the Symposium conducted on the Mita Campus, which was broadcast in real time at the School of Medicine on the Shinanomachi Campus, there were more than 200 participants, including researchers from private sector companies as well as the general public with an interest in the central theme.

A symposium was held in July 2006 on the theme of "Sports as a Guide to the Future: Research and advancement in sports medicine, science, and culture." The Symposium welcomed a wide range of speakers, including researchers in sports medicine, as well as a professor of literature who spoke about sports in ancient Greece; an Olympic gold medalist; a manager from a companies with extensive experience in supporting sports; a merchandiser from a manufacturer that developed sportswear jointly with Keio University; a university sports trainer; and a producer of sporting events. There were about 230 participants in total, including researchers from inside and outside Keio University, students, parents with children, and adults involved in sports either through work or as a hobby. Overall, the Symposium was a great success.

Speaker's name / Title of Presentation			
	Date	Affiliation/name	Title of presentation
1st	Dec. 20, 2005	Professor, Medical Chemistry, School of Medicine Makoto Suematsu	Investigating biological functions using metabolome analysis, and applications in medicine
		Professor, Department of Biosciences and Informatics, Faculty of Science and Technology Hiroshi Yanagawa	Genome drug production systems using the <i>In vitro</i> virus (IVV)
2nd	Apr. 14, 2006	Assistant Professor, Surgery, School of Medicine Yuko Kitagawa	Developments in Solid Cancer diagnosis and treatment using Sentinel node theory: What can be expected of engineering technologies?
		Assistant Professor, Department of Mechanical Engineering, Faculty of Science and Technology Norihisa Miki	Contributions of micromachine technologies to medicine: From "Fantastic Voyage" to diagnostic chips
3rd	Jul. 11, 2006	Professor, Department of Mechanical Engineering, Faculty of Science and Technology Takashi Maeno	Touch sensors and touch displays
		Assistant Professor, Regenerative Medicine, School of Medicine Motoaki Sano	Peroxisome proliferators-activated receptor $\gamma$ (PPAR $\gamma$ ) coactivator 1 as a factor in the control of cardiac muscle energy metabolism

### February 2006 Keio University Advanced Science and Technology Symposium: "21st Century Brain Science Frontier"

Opening comments	Yuichiro Anzai (President, Keio University)
"Research in the generation and regeneration of the central nervous system using stem cells"	Hideyuki Okano (Professor, School of Medicine (Physiology), Keio University)
"Memory Research using the Cerebellum Model: Investigating synapses and behaviors from two elements"	Michisuke Yuzaki (Professor, School of Medicine (Physiology), Keio University)
Keynote Speech "The Mysteries of Life, Unraveled by Calcium"	Katsuhiko Mikoshiba (Professor, The Institute of Medical Science, The University of Tokyo (Cerebral Nerve Generation); Director for Developmental Brain Science Group, Brain Science Institute, RIKEN (Institute of Physical and Chemical Research))
"Information Processing in single nerve cell dendrites"	Kotaro Oka (Professor, Faculty of Science and Technology (Department of Biosciences and Informatics), Keio University)
"Cerebral nerve activity operating machinery: Development of brain-machine interfaces"	Susumu Takahashi (Kyoto University Graduate School, Graduate School of Letters, Dept. of Behavioral Culture)
"Is the hippocampus of birds the same as the hippocampus of mammals? Comparative research in cognitive neuroscience"	Shigeru Watanabe (Professor, Faculty of Letters (Psychology), Keio University)
"The conditions under which language is born"	Kazuo Okanoya (Biolinguistics Research Team Leader, Advanced Brain Function Development Research Group, RIKEN Brain Science Institute)
Keynote Speech "Viewing brain functions via fMRI"	Seiji Ogawa (Visiting Professor, School of Medicine, Keio University; Director, Ogawa Laboratories for Brain Function Research)
Special Lecture "Conditions for Innovations"	Haruo Naito (President and CEO; Eisai Co. Ltd.)
Panel Discussion	Yuichiro Anzai, Seiji Ogawa, Haruo Naito, Katsuhiko Mikoshiba Moderator: Hideyuki Okano
M.C.: Prof. Junji Yoshihara (Director, Keio University Center for Research Promotion)	Jointly sponsored by three 21st Century COE Programs: "Understanding and control of bio-functions using system biology" "Toward and integrated methodology for the study of the mind: Centre for Integrated Research on the Mind" "Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches based on the Development of Experimental Animal Models"



Prof. Okano gives a presentation



Panel Discussion

### Symposium: "Sports as a Guide to the Future"

Keynote Speech	"Initiative to the Future: Current conditions and new developments in sports medicine" Hajime Yamazaki (Vice-President, Keio University; Director of the Sports Medicine Research Center)
Special Lecture	"Corporate Social Responsibility (CSR) and sports support activities" Kazuyasu Kato (President, Kirin Brewery Company, Ltd.)
Part 1: Dialogue	"Talking about sports medicine and science" "Contributions by sports medicine and science to Quality of Life" Shinzo Kato (Uniqlo Co. Ltd., Men's Business Division; Merchandising Team) Shohei Onishi (Keio University Graduate School of Health Management, Committee Chairman; Vice-Director of the Sports Medicine Research Center)
Part 2: Lecture	"Talking about Sports Culture" "Sports and Literature in Ancient Greece: the Case of Pindaros" Taro Nishimura (Vice-President, Keio University; Professor, Faculty of Letters)
Special Lecture	"Advancement of Sports Culture that Opens up the Future" Kenji Ogiwara (Gold Medalist at the 1998 Nagano Winter Olympics; Member of the House of Councilors)
Part 3:	"Panel Discussion" "Health Society / Sports Society: Talking about sports and Universities, and about sports and society" Shohei Onishi (Keio University Graduate School of Health Management, Committee Chairman; Vice-Director of the Sports Medicine Research Center) Akiyo Ueda (Manager, Japanese National Rugby Team U-21; Former Manager, Keio University Rugby (Football) Club) Tsumoto Aiba (Manager, Keio University Baseball Club) Moderator: Shigeru Sugiyama (Sports event producer, Guest Professor, Keio University Graduate School of Health Management)
M.C.:	Prof. Junji Yoshihara (Director, Keio University Center for Research Promotion)



House of Councilors member Kenji Ogiwara speaks to the group; photo in the background was taken when he won his gold medal



Participants listening on the edge of their seats

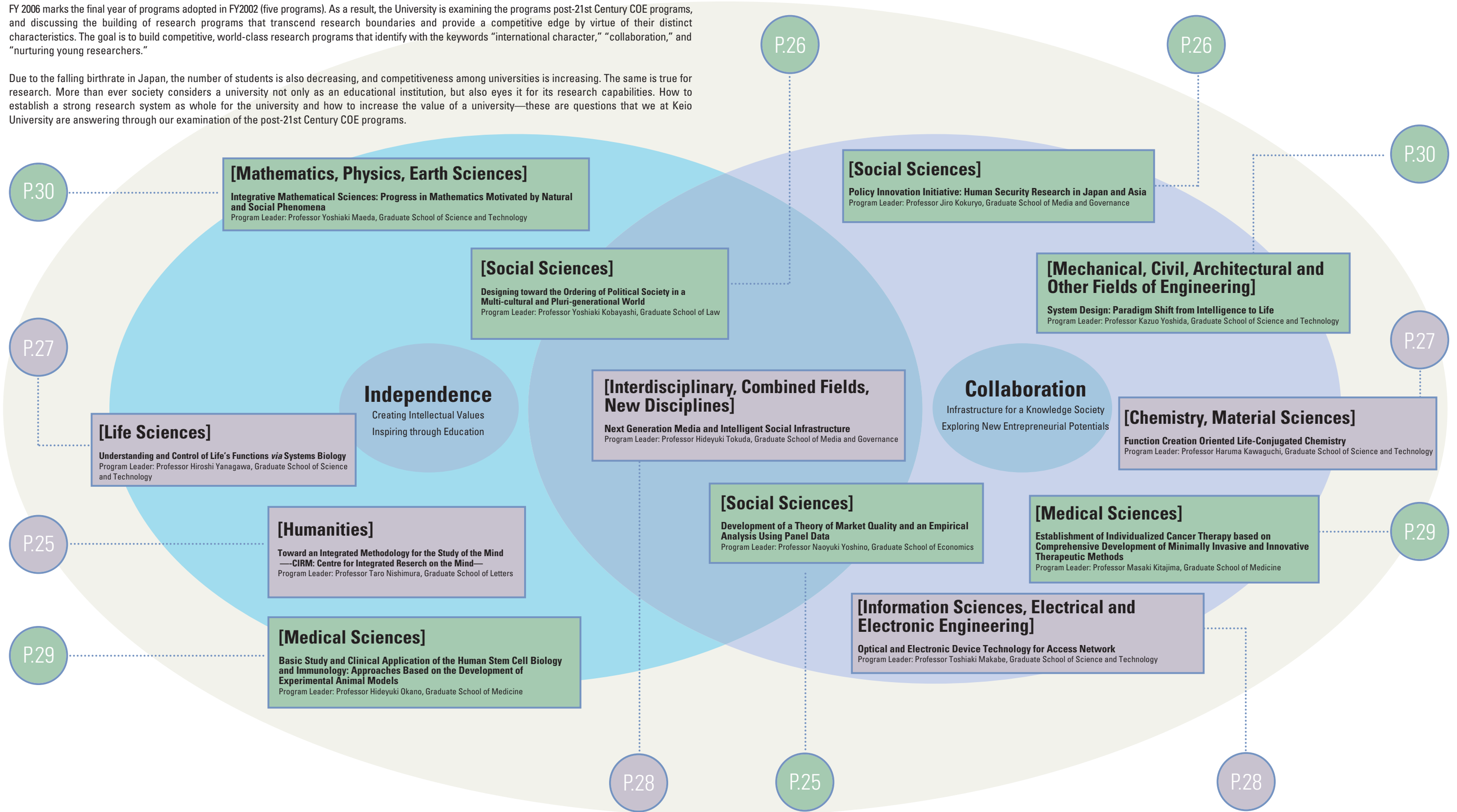
# The 21st Century COE Program

Since its foundation in 1858, Keio University has been at the forefront of education and research in Japan. For 148 years, Keio has consistently fulfilled its mission to contribute back to society through its academic and research achievements in fields such as industry and medicine. Keio has also made substantial contributions through fostering the leaders of society and creating new areas of knowledge. Keio University continues to be a driving force in contributing to the future of Japan and the global community. The University's application to participate in the 21st Century COE Program for FY2002 and FY2003 is an opportunity to advance its fundamental mission through two main focuses: "independence" i.e., remaining impartial and unaffected by the short-term trends of society; and "collaboration" i.e., working with contemporary society to achieve results. Keio University aims to become a leader in the global society of the 21st century through the creation of dynamic development and integration of these two focus points at an international level, based upon a unique elliptical model.

FY 2006 marks the final year of programs adopted in FY2002 (five programs). As a result, the University is examining the programs post-21st Century COE programs, and discussing the building of research programs that transcend research boundaries and provide a competitive edge by virtue of their distinct characteristics. The goal is to build competitive, world-class research programs that identify with the keywords "international character," "collaboration," and "nurturing young researchers."

Due to the falling birthrate in Japan, the number of students is also decreasing, and competitiveness among universities is increasing. The same is true for research. More than ever society considers a university not only as an educational institution, but also eyes it for its research capabilities. How to establish a strong research system as whole for the university and how to increase the value of a university—these are questions that we at Keio University are answering through our examination of the post-21st Century COE programs.

Links to each of the 9 fields and 12 programs at Keio University are available at the following URL:  
[http://www.21coe.keio.ac.jp/index\\_en.html](http://www.21coe.keio.ac.jp/index_en.html)  
 For more information about the 21st Century COE Program, refer to the Japan Society for the Promotion of Science website:  
<http://web.jsps.go.jp/english/e-21coe/index.html>



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

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

The Centre for Integrated Research on the Mind (CIRM), which was elected as a 21st Century Center of Excellence Program in 2002, from the beginning has developed academic cooperation with overseas research institutions as well as foreign scholars. We organized an international symposium with l'Ecole Normale Superieule de Paris at Paris in 2003 and with the Konrad Lorenz Institute at Vienna in 2004. Proceeding from these achievements, in 2005 besides regular project activities we held 17 lecture seminars by foreign scholars, 15 international symposia, 15 research seminars, and workshop programs. Among these, the international symposium "Intra and Inter Species Communication: Integration of Ethology and Ethnology," organized by Shigeru Watanabe (CIRM) and Dominique Lestel (l'Ecole Normale Superieure de Paris), and which tried to integrate ethology and ethnology, was held in August in Budapest, Hungary. Also, the international symposium "Reasoning and Cognition," focusing on logical thinking and social cognition, organized by the French Embassy and CIRM, was held in December at our Mita campus. In the symposium, a group of scholars of cognition science and philosophy from l'Ecole Normale Superieure de Paris and scholars of the Logic and Language Project and the Evolution Project at CIRM presented the results of our international interdisciplinary research project.

Domestically, on September 10 a symposium "Towards an Integrated Science on the Mind," organized by the Japanese Psychonomic Society and CIRM, was held at our Mita campus. Two scholars each from the fields of natural science, social science and the humanities gave lectures and discussed the theme of the mind from their own points of view. Also on September 15, CIRM hosted a symposium "Body, Self and Time: From Philosophy of the Mind to

Neuroscience" together with two other COE Programs at the School of Science and Technology, namely "System Design: Paradigm Shift from Intelligence to Life" and "Understanding and Control of Life Function via Systems Biology." In this symposium, Professor Shinsuke Shimojo of the California Institute of Technology gave a special lecture.

Toward creating an environment conducive to fostering a new generation of researchers, the following further developments must be mentioned. First, we selected 18 students of the Graduate School of Letters and Social science for research grants based on examinations of their actual research plans; in February 2006 all the students gave public presentations on the results of their researches. Second, in 2005 we started together with the Graduate School of Letters and the Graduate School of Social Science an "Interdisciplinary Graduate Program on the Mind, Brain and Reasoning," which was elected by the Ministry of Education and Science as one of the "Initiatives for Attractive Education in Graduate Schools." This new program, based on our interdisciplinary research projects in CIRM, aims to produce researchers of the next generation. At the same time we hope it will give a guarantee of the continuity of our program.

Two reports of our research projects, *Cognition et emotion dans le langage* and *Reasoning and Cognition*, were published, as well as *Research Reports of Graduate School Students in 2005*.

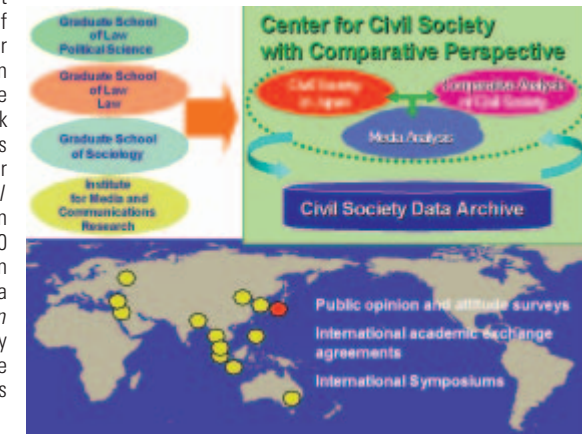
## Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World

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

### An International Base for Research

As a program dedicated to the promotion of research on public opinions and attitudes in a global and multicultural world, building international research networks constitutes one of the core strategies of the Center for Civil Society with Comparative Perspective.

Having conducted systematic and large-scale public opinion surveys in 13 countries, the Center boasts collaborative partnerships with 31 universities and 34 researchers both in and outside Japan. To further facilitate research networking that extends to different areas of the world including Asia and Europe, the Center has established academic cooperation agreements with government agencies, research institutes, and universities in Japan and overseas which that share common research objectives. Through these international links the Center regularly hosts joint workshops and symposiums with scholars of world renown as guest speakers. Some of our efforts have already appeared in a Korean newspaper with a national circulation. The Center's publications also serve as an important link with other educational and research institutions in disseminating our research efforts. Our English-language academic journal, the *Journal of Political Science and Sociology*, has been added to the library collections of more than 60 universities worldwide. Furthermore, the main work of associated researchers was compiled in a 16-volume book series *Dynamics of Civil Society in a Multicultural World*, which has been favorably reviewed by major newspapers. Three of the titles are also published in translated editions outside Japan.



### Providing International Research Training

The Center also puts as one of its central objectives the education and training of young researchers, for which four strategies have been developed. 1) To strengthen international competitiveness, support has been given to doctoral students wishing to present papers at international conferences or in English-language journals in the form of 'academic writing' and 'academic presentation' seminars. 2) For practical training, we have launched special graduate courses through which students can participate in research projects with visiting professors and researchers from abroad. 3) In terms of competitive selection of researchers, the Center adopts an open recruitment policy for the posts of COE research fellows and assistant researchers. 4) Finally, research grants are allocated to graduate students and young researchers through an open competition, while travel grants have been made available to those embarking on fieldwork or participating in conferences or symposiums in Europe, the US, South Korea, China and Australia. The result of the above strategies can be seen in the increased number (a 40% increase compared to the project's launching year) of publications and presentations by doctoral students.

## 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/>

### (1) Research on a Theory of Market Quality

In an unsophisticated market, fraud and cheating occur on a daily basis. How to improve the "quality of markets" is a key question of this 21st COE project. A high-quality market assures the transactions between the suppliers and the demanders. An environment of appropriately designed laws and institutions has to be well established in order to make the market high-quality. At the same time, the laws and institutions change as the market evolves in the process of economic development. Feedback exists between the market and the underlying laws and institutions. A new journal, *The International Journal of Economic Theory* (Blackwell), started in cooperation with the 21st COE Program (Keio University) and Kyoto University, and *Reforming Systems in the Age of Quality* (by Makoto Yano) are based on the above concept.

### International Journals

*Asian Economic Papers* (MIT Press)  
*The International Journal of Economic Theory* (Blackwell)  
 (Many editorial pieces have appeared in several national newspapers, such as the Asahi Shimbun.)

### Exchanges of Papers and Comments through International Conferences

International Conference on Economic Theory  
 Jakarta Public-Private Partnership (PPP) Seminar  
 Regional Capital Integration-Japan, Korea, China conference

### International Research Networks

Chinese Academy of Social Sciences (CASS)  
 Korea Institute of Economic Policy (KIEP)  
 Bank of Thailand, Indonesian Ministry of Finance  
 University of the Philippines  
 Singapore University  
 World Savings Bank Institute



International Journals (21st COE Program)

### (2) Analysis of Keio Household Panel Data

Household data of more than 4000 families (7000 individuals) are collected every year by the 21st COE project. The main characteristic of this survey is asking questions to the same households every year so that changes in the family and individuals' behaviors can be obtained. The survey started in 2004, and data have been accumulated for these three years. The surveys ask such questions as income, savings, choice of jobs, working hours, etc. Accumulation of the same family data indicates various changes in their behaviors. Phenomena such as the increase of jobless youths and the participation of female into the labor market after the

introduction of the equal job opportunity law can be analyzed by these panel data.

New financing methods of public works such as revenue bonds will change households' job behaviors in rural regions. New financial transaction laws could change savings pattern of households.

Continual collection of data can identify various changes in households' behavior due to improvement of laws and institutions. These household data can empirically identify the impact of the changes in the quality of the market on household behaviors. Each year, the obtained results are published and the data used by outside researchers. *Dynamism of Households' Behavior* (edited by Yoshio Higuchi) is a collected work based on these panel data.



Young researchers at work

### (3) International Cooperation of Research in Asia

Financial markets in Asia are not as well-developed compared to the U.S. or Europe. However, a high saving rate can be seen in many Asian countries. Most of these funds are invested in the U.S. and Europe at first and then return to Asian countries as investments from the U.S. and Europe. By contrast, about 68% of funds are internally collected in Europe and transacted across European countries.

Lack of transparent legal systems, lack of well-functioning financial markets, and lack of financial products are among the many reasons for the small transaction among Asian countries. How to improve the quality of financial markets is one of our key research interests. Scher and Yoshino's *Small Savings Mobilization and Asian Economic Development* (2004, M.E. Sharpe) is a product of the research results.

The second issue is a new financing method of public spending such as infrastructure. Private Public Partnership, especially revenue bond is planned to be applied in such Asian countries as Indonesia, Thailand, Malaysia and Mongolia under the leadership of this 21st COE program. Three volumes of *Asian Economic Papers* (MIT Press) are issued a year based on these research. The 21st COE Program is one of the key supporting institutions together with Columbia University, KIEP (Korea Institute of Economic Policy), and institutions in Indonesia, Philippines, Singapore, Thailand, Malaysia, etc. Research network among Asian scholars is established by an international conference held every year through this international journal AEP.

## Policy Innovation Initiative: Human Security Research in Japan and Asia

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

This 21st Century COE Program has been pressing ahead with its current initiative of establishing a center for *sougou seisakugaku* or integrated policy management through the study of human security. In 2005, the year of the initiative's mid-term assessment, we reviewed what had been achieved, re-defined what should ultimately be management accomplished, and carried out a restructuring process in accordance with our aims.

One very important development in FY2005 has been the identification of *sougou seisakugaku* as a practical study. The aim of *sougou seisakugaku* is not only to take cognizance of contemporary society objectively and correctly, but to identify problem areas based on that cognizance, to find ways leading to effective policy solutions, and to consequently add to our stock of knowledge in this area. On February 4, 2006, we invited authorities in this field to organize a workshop introducing the issues of this COE program as the theme of discussion, and we put forward our role in this new initiative. The discussions that led to the above definition of these studies are covered in a book published in early 2006. In FY2005, we produced 42 working papers, published 109 theses, and co-authored 12 books in addition to the above.

Our research activities convinced us that the premise of human security as a field of practice oriented research endeavor was appropriate and correct. In our approach toward the currently imperative theme of human security, supporting such a security framework means to focus on human beings at particular locales rather than on large systems under the umbrella of nation states. Given such consensus, researchers of this COE program utilize methods of theoretical and applied sciences at locales where human security is under threat, engaging in uncovering problems and generating policy solutions together with the people at those locales (sometimes also being affected by nation-wide organizations). Researchers have taken part in studies at various locales ranging from research in forest destruction in China to nursing programs for the aged in Japan. As this approach seems to offer more possibilities for solving global problems such as environmental issues, we believe that *sougou seisakugaku* can break new grounds in contemporary research.

The PhD students employed as research assistant(RAs) have made great progress in carrying out theoretical and applied science in the field of human security. Some RAs from our COE program also obtained their PhD, and nearly another 20 students are expected to earn their PhD in a couple of years. Since we believe that one of our most important tasks for COE is to encourage young pioneers, it is our great pleasure to see them launching forth with excellent results.

We believe that the initiative of *sougou seisakugaku* should not only be extended within Japan, but also worldwide. This COE program is trying to establish a framework for researchers in Japan to exchange research results with their counterparts in Vietnam, Thailand, and China on an ongoing basis. Also we are planning to include *sougou seisakugaku* in the curriculum of the International Advanced Degrees Program (in which a master's degree must be completed in English) offered by the Graduate School of Media and Governance. Part of this program is expected to begin in FY2007.



Workshop "Sougou seisakugaku: A Practice Oriented Approach to Studying and Solving Social Issues"

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

Program Leader: Professor Hiroshi Yanagawa, Graduate School of Science and Technology  
<http://www.coebio.keio.ac.jp/index.cgi?je=1>

The center aims to utilize biological informatics to guide the development and application of novel biologically active molecular probes to regulate cell and organ functions, as well as to reconstitute biological system functions *in vitro* and to modulate them *in vivo*. To facilitate interdisciplinary research training of postgraduate students, the Keio Bioscience Interactive Research Program (KBIRP) supports those who are interested in themes in integrative biology, from the molecular level to the organism level, as well as those aiming at integrating the engineering and biomedical sciences.

The center has focused on three major research domains: collection and integration of large-scale information on genome, proteome, and metabolome (Domain A); development and application of biological molecular probes (Domain B); and reconstitution and artificial control of biological function (Domain C). These cutting-edge interdisciplinary biosciences have great potential to advance systems biology. Broadly, the goal of KBIRP is to construct a multidisciplinary bridge between informatics and experimental biological sciences. This year the center promoted especially cooperation between Domains A and C, Domains B and C, and Domains A, B and C. Domain(A + C) achieved a large-scale analysis of genome, proteome, and metabolome; prediction of domain-domain interaction of proteins; prediction of detection time of CE-MS; and visualization of multi-omics data. Domain(B + C) developed new bioprobes and their application for controlling and imaging biosystems. Domain(A + B + C) accomplished the finding of a new regulatory mechanism of gas-mediated metabolisms, the simulation of movements of nerve cells in brain cortex formation, and the simulation of rational treatments of cancer and diabetes.

Research activities at the center are coupled with educational programs on several campuses of Keio University (the Graduate School of Science and Technology in Yokohama, the Graduate School of Medicine in Tokyo, the Graduate School of Media and Governance at the Shonan Fujisawa campus, and the Institute for Advanced Biosciences at the Tsuruoka Town campus). KBIRP recruited 50 postgraduate students including seven international students as research assistants (RA) on these campuses so that they can share the same curricula for understanding systems biology. Seven RAs received the competitive research fellowship supported by the COE program to visit foreign research laboratories in collaboration with COE. KBIRP awarded the Certificate of the COE Research Cooperation Program to 27 RAs who fulfilled more than one program and completed their doctorates. The center strongly promotes research cooperation with domestic and foreign institutions and universities, and some RAs are staying in American and European universities including Massachusetts General Hospital, Duke University, Aalborg University, the Forsyth Institute, the University of Nebraska-Lincoln, the University of Auckland, and the University of California, Los Angeles, for short periods of time. The center has also taken in RAs from foreign countries, including China, South Korea, Taiwan, Thailand, and Bangladesh. Remote lectures for COE-Systems Biology and progress workshops were held *via* high-performance telecommunications systems. In 2005, four symposia including two international symposia were held at the Mita, Shinanomachi, and Yagami campuses, and an intensive workshop was held for the education of young RAs at the Shonan International Village from September 19 to 21.

## Function Creation Oriented Life-Conjugated Chemistry

Program Leader: Professor Haruma Kawaguchi, Graduate School of Science and Technology  
<http://www.lcc.keio.ac.jp/index.cgi?je=1>

In our 21st Century COE Program "Function Creation Oriented Life-Conjugated Chemistry," "Life-conjugated chemistry (LCC)" is defined as the chemistry to improve the quality of life, including safety, health, medical care, and comfort. Since the program started in 2002, 17 faculty members, three postdoctoral fellows, and 30 research assistants have been involved in establishing the Center of Excellence for the research and education on LCC. Among our activities, international ones are listed below:

1. Members were engaged in collaborating works in one of three research groups: a group to create new functional materials by means of function designing, a group to create new functional materials learning from bio-molecules and bio-systems, and a group to create new functional materials by using hierarchic architecture. As a result, a number of innovative functional materials were created and registered in the "LCC Chemical Bank," which is our original database collecting our achievements. Main products were bio-sensors, remote sensing systems, diamond electrode, energy transforming materials, biofunctional molecules, supra-structured nano-materials, etc.

- Members were active in the international academic community and pursued collaboration with overseas leaders. Eight international symposia were organized by LCC members for four years. Such symposia raised our group's and members' reputation. Two more symposia are scheduled in next spring. In addition, more than a half of LCC members will visit RWTH Aachen (The Aachen University of Technology) this fall to make our achievement open.
- Biochemists in Yonsei University and Keio University started collaborating in 2005. The first joint symposium was held in Seoul last year and the second one will be held in Yokohama this year.
- Research associates (RA) attended more than 20 special seminars presented by distinguished foreign guests last year. All of the RAs had an obligation to present papers at international conferences at least once a year. Four RA students were sent to abroad to work for cooperative research program.

### 21st Century COE KEIO-LCC International Symposia

Theme of Symposium	Dates	No. of Participants (Overseas Participants)	Chairperson
1. Frontiers of Nanoscale World	February 20, 2003	128 ( 7)	Prof. Atsushi Nakajima
2. Diamond Electrochemistry and Related Topics (7th International Mini-Symposium on Diamond Electrochemistry)	March 30 and 31, 2004	98 ( 18)	Assoc. Prof. Yasuaki Einaga
3. Functional Colloids and Surfaces	January 21, 2005	72 ( 7)	Prof. Haruma Kawaguchi
4. Carbon Films: Applications for Life and Environment (8th International Mini-Symposium on Diamond Electrochemistry and Related Topics)	March 4 and 5, 2005	99 ( 20)	Assoc. Prof. Yasuaki Einaga
5. Organic and Bioorganic Chemistry	March 12, 2005	45 ( 9)	Prof. Kazunobu Toshima
6. Frontiers of Nanoscale World: from Nanoclusters to Nanomedicine	September 22, 2005	79 ( 6)	Prof. Atsushi Nakajima
7. Organic and Bioorganic Chemistry	November 22, 2005	81 ( 10)	Prof. Kazunobu Toshima
8. PACIFICHEM 2005-Chemical sensors, Biosensors, and Sensing Technologies	December 18-20, 2005	280 (130)	Prof. Koji Suzuki

## Optical and Electronic Device Technology for Access Network

Program Leader: Professor Toshiaki Makabe, Graduate School of Science and Technology  
<http://www.coee.keio.ac.jp/index.cgi?je=1>

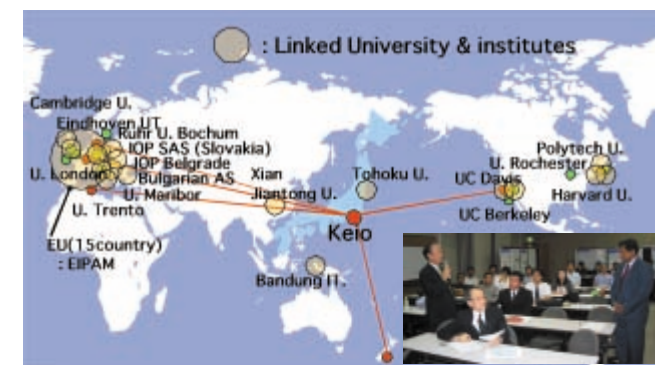
In this era of globalization, international collaborative networks engaged in academic fusion are essential for the achievement of scientific breakthroughs. Since this program first began in 2002, the [Information Sciences, Electrical and Electronic Engineering] COE has continued its activities as a Center for academic fusion between "Device technologies" and "System networks," building relationships based on an International "Network of Excellence" with more than 30 universities and research institutions located in Europe, North America, and Asia.

In addition to long-term staff exchanges for international collaborative research and education activities, we have won high acclaim for our International Internship program, in which COE Research Assistants are dispatched to overseas affiliates for six-month periods. Already, more than ten RAs have participated in this Internship. One of the most important tasks of our COE program is to foster the industry awareness of PhD students through COE-RAs providing them with opportunity to absorb a rich variety of expertise related to both "Device technologies" and "System networks." With the cooperation of JEITA, Advanced Science and Technology course has been offered by inviting more than 80 lecturers from leading companies.

This COE has held international workshops on five continents. In 2005, we held a bilateral workshop welcoming a group of professors from Germany to commemorate "2005/2006 Deutschland in Japan," and to increase the visibility of Keio University's COE activities. In December 2005, we held the 2nd International Symposium at the Tokyo International Forum.

Keio University's COE activities have given rise to many unique integrated technologies, including "Wireless Interconnect Technologies for LSI chips" (Prof. Kuroda); "Visible Light Communications" (Prof. Nakagawa), and "Giga-Bit POF

Networks & Hard Real-Time Interactive System Control" (Profs. Koike and Ohnishi). As of the end of the 2005 academic year, we had published 350 journal papers (224 in English and 126 in Japanese), given 101 invited talks and 576 presentations at International Conferences, and published 17 workshop/symposium proceedings and reports on COE activities. In Autumn 2006, Baifukan Co. Ltd. (Tokyo) publish "21 seiki Souzu Gijutsu Rikkoku he no Michi (The Road to Becoming a Nation of Creative Technology in the 21st Century)," which documents the intent and strategies behind the formation of Keio University's COE program in the field of Information, Electric, and Electronics, as well as the career paths of PhDs who received their training and education in this environment.



Network of Excellence

## Next Generation Media and Intelligent Social Infrastructure

Program Leader: Professor Hideyuki Tokuda, Graduate School of Media and Governance  
<http://www.coe21.sfc.keio.ac.jp/index.html.en>

### Program Summary

The objective of our program is to develop a new architecture of the intelligent social infrastructure which supports our life, environment, culture, education, and medical care in the 21st century. The research is conducted by the collaboration among IT researchers, informatics and digital media researchers and political scientists at Shonan Fujisawa Campus, Keio University. The research center is organized by three research groups namely the Next Generation Information Infrastructure Group, the Next Generation Application Group, and the Empirical Social Experiment Group. The center's unique feature is that three groups collaborate with local governments, educational institutes, research institutes and other organizations for empirical social experiments based on so called the "skewered three layers" model. The research project is also unique that it is built in the curriculum of the graduate school of media and governance. The Next Generation Information Infrastructure Group investigated ubiquitous networks and computing environment, semantic web systems, multi-database systems, satellite-based internet technologies based on the experiments among Asian universities. The Next Generation Application Group has been developing many applications ranging from advanced e-learning systems to unique ubiquitous media and contents. The e-governance subgroup of the Empirical Social Experiment Group designed and implemented evaluation methods and information sharing systems for educational services of local governments. It was used at many high schools in Miyagi prefecture and

elementary schools in Adachi Ward, Tokyo. It demonstrated the effectiveness of the system for school evaluation. The e-learning subgroup also developed new course materials based on collaboration with many junior high schools in Fujisawa city, Taiwan, Korea, and United States. They also evaluated new distance learning systems based on experiments among Beijing University and four French universities and contents development using podcasting, and web. The e-space subgroup also developed internet GIS systems, web-based support systems for policy design and management.

We have organized International Workshop on "Collaborate! In search for Intelligent Social Infrastructure" in January, 2005 and then we hosted International Workshop on "Ubiquitous Media and Social Infrastructure" at Stanford University in August 2005. During the workshop, many research assistant(RAs) presented their collaborative research works and their methodology. Throughout active discussion with foreign researchers they deepened their understanding of the intelligent social infrastructure. At the research center, 18 RAs have been awarded Ph.D. degrees in 2005, and many awards and prizes such as a Minister Award of Ministry of Internal Affairs and Communications, a Green City Award of the Prime Minister, a Special Award of Japanese Marketing Science Association, and a Minister Award of MICS JGN2 R&D idea contests were also awarded.



International Workshop on "Ubiquitous Media and Social Infrastructure" at Stanford University

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

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

This institution mainly focuses on research dealing with development of three areas: new diagnostic methods, minimally invasive therapy, and new treatments that enable individualized cancer therapy in the near future. In addition we aim to train oncologists and researchers with expertise in oncology to comprehend basic medical sciences as well as clinical medicine in these areas. It is determined that we should be mutually associated to focus on the following four subjects with the hope that the results of the training would lead to clinical practice at the early stage of the training.

### 1. Individualized medication based on the patient's constitution and nature of cancer cells

The research is enhanced, taking the view that individualized treatment achieved by the early detection of cancers and anti-cancer drug sensitivity profiling should be improved. The research on individualized treatments has been structured with the foundation of exploring novel biomaterials that are candidates for tumor markers. This search is supported by exhaustive analysis techniques such as the genotyping, DNA microarrays and metabolic profiling, and pharmacogenomics. The ongoing developmental projects are: minimally invasive tests for the detection of early lung cancers, new *in vivo* imaging methods for multi-drug resistance genes (MDRI) through radionuclide labeling, diagnostic methods supported by nanobioticles containing anti-cancer drugs and RNase protein incubation, and the delivery system of anticancer drugs. These developmental projects have been internationally acclaimed. The 15th Keio University International Symposium for Life Sciences and Medicine: "Pharmacokinetic, Pharmacodynamic, and Pharmacogenomic Approaches for Measuring and Managing Variability in Drug Response" was held under the leadership of Dr. Tanigawara. This international symposium focused on the aforementioned drug response, resulting in strengthening international collaboration with the overseas institutions that attended the symposium, and allowed us to dispatch researchers to the interested institutions. Also, Dr. Sakamoto joined the international congress as a member of the International Consensus Group for Hepatic Neoplasia and contributed to the establishment of consensus and the diagnostic standard for early-stage hepatocellular carcinoma and precancerous lesions.

### 2. The development of the diagnosis and the treatment methods targeting sentinel lymph node (SN)

Dr. Kitajima, Dr. Kubo, and Dr. Kitagawa launched a joint large-scale test with multiple institutions in covering SN navigation surgery for gastric cancers and breast cancers, which turned out to be the first trial in this country. The SN navigation surgery on gastric cancers initiated by our institution went public at the 6th IGCC where the surgical technique was demonstrated at Keio University and broadcasted on-air, leading to the worldwide recognition of this surgical method. Also, the Lymphoseek which is considered to be the new tracer to identify SN was brought to clinical practice under a tie-up with the University of California, San Diego.

### 3. The development of upgraded forceps and tactile sensing technology in endoscopic surgery

The robot-assisted surgery was developed by Dr. Morikawa and Dr. Nakazawa. The robot is equipped with flexible spine feedback function, and this achieved not only domestic but also international reputation among surgeons with good knowledge of robot-assisted surgery. The clinical practice of this robot-assisted surgery has currently been prepared smoothly. Also, Dr. Yozu has experience of more than 200 cases of minimally invasive cardiac surgery using the port-access method. The surgery was openly shown to visitors from overseas, and eventually, owing to his contribution the port-access method, has become widely spread in the world.

### 4. The development of minimally invasive therapy focusing on immunotherapy and cryoablation

Cryoablation went into clinical practice against liver cancer (more than 100 cases), lung cancer (more than 60 cases), and pancreatic cancer (more than 30 cases) under the guidance of Dr. Kitajima, Dr. Kobayashi, and Dr. Murai. Supported by no additional treatment, the safety of the cryoablation was confirmed. Larger tumors underwent the freezing technology to simulate temperature distribution. This work has been continued, led by Dr. Arai, Dr. Kuribayashi, and Dr. Kobayashi, to develop the best suited freezing technology. Dr. Kawakami injected dendritic cells into the mouse tumor-model after cryoablation and found regression of the systemic tumor when antibody T-cells was induced. Clinical practice was then conducted on melanoma and liver metastasis from gastrointestinal cancer.

In November 2006 an international symposium is scheduled to discuss and evaluate the results of the four subjects above, and world-class leaders in these subjects will be invited.

## 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/>

This COE received a very high rating (an "A" rating) in its intermediate evaluation in 2005, and has continued to make great leaps forward as an International Center for Stem Cell Research. It was one of only five research facilities in Japan to have been selected as a "global stem cell research center" (ref: <http://mbbnet.umn.edu/scmap/scresearchmap.html>). It has initiated close collaborations with the Lund Stem Cell Center in Sweden, one of the world's top stem cell research centers. Represented by Professor Toshio Suda, who is one of key members of this COE, we could obtain an international collaborative grant from the Japan Society for the Promotion of Science (JSPS), named "JSPS Core-to-Core Program" to further strengthen ties with Lund University and this COE (ref. Figure).

Projects that began after the start of the COE program have begun to generate notable results that have been published in many top-level international journals, including *Cell*, *Nature*, *Science*, *Nature Medicine*, *Nature Biotechnology*, *Nature Immunology*, *Nature Neuroscience*, and *PNAS*.

In terms of education, the COE has conducted training through presentations and discussions at the COEX Meeting, where research data is presented in English, as part of efforts to foster young researchers who can be active on a global stage. At the same time, it has held seminars on an average of once each month, inviting

researchers from overseas to exchange information and participate in international exchanges. The following three elements form the new basis for the operations of this COE.

### I) COE Stem Cell Biology/Immunology Research and Education Center

The "COE Stem Cell Biology/Immunology Research and Education Center" has been established (Center Director: Yumi Matsuzaki; Special COE Research Associate Professor), and operations are being strengthened to promote a collaborative research structure within Keio University. The Center currently has 69 registered users, and the utilization rate is among the best in Japan, averaging 75 hours per week.

### II) Setup of COE Small Fish Research Center

New activities in 2005 included the setup of a new facility (the COE Small Fish Research Center) for research on killifish, zebra fish, and other small fish.

### III) Construction of COE Mouse Database (SCAD)

A new mouse database (Shinanomachi Campus Animal Database, SCAD) was constructed in 2005, to strengthen the system for promoting effective use of genetically altered mice at Keio University, and to promote collaborative research in this area.

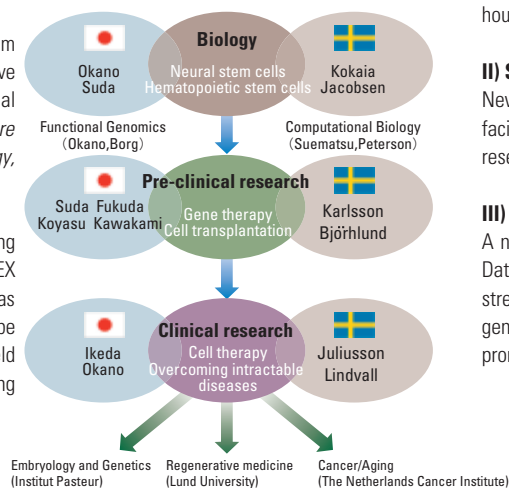


Figure: Core-to-Core Program between the Keio University COE and Lund University (SCC)

## 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 in Integrative Mathematical Sciences focuses on the following two projects: 1) study of mathematical objects related to "noncommutativity" and 2) the analysis of nonlinear phenomena via data science. The two groups also collaborate on projects. The noncommutative project group is integrating research topics on geometry, topology, ergodic theory, number theory, algebraic geometry and integrable systems, and the group also cooperates on physics problems. This group is working toward establishing an international research group on noncommutative geometry. The data science group is developing research topics on mathematical modeling of various phenomena driven by data science. Its main three topics are neural networks, destruction, and market risks.

This COE program has had remarkable progress in yielding research works by project members. In FY2005, it employed 13 research assistants and five post doctoral researchers, and they lends various support to the PhD students to encourage their studies. For this year, we had 30 PhD students join our program, and young researchers produced about 50 papers and 70 presentations at international and domestic conferences. Our PhD students do not work just in academic positions but also at companies, which is one of our aims. The international workshop "Cherry Bud Workshop 2006," focusing on mathematical modeling, encouraged young researchers to develop their research careers not only in academia, but also in fields such as finance and insurance.

This COE program has a mission to encourage international research and to develop international cooperation programs with several international institutions. We invited over 70 overseas researchers to the program and arranged the Pathways Lecture Series in Mathematics (14 sessions), which encourages the research works of students. We have deep cooperation with Cologne University and Beijing University by inviting researchers and organizing an international conference. This COE program made research partnerships with the École Polytechnique Fédérale de Lausanne (EPFL) and Cork College University. The program is now proceeding to have an exchange program with Boston University. We are also planning to have international visiting programs with Pennsylvania State University, Boston University, the University of California, Berkeley, Warwick University and Bourgogne University. We have a good partnership with the Institut des Hautes Études Scientifiques (IHES) in which we exchange researchers and organize international workshops. The international workshop on Noncommutative Geometry and Physics 2005 was organized with the cooperation of Tohoku University and Beijing University.

By successfully implementing these planned projects, we were able to obtain high evaluations for the international research activities. Our goal is to establish an official research center in Keio University by the end of this COE program.

## System Design: Paradigm Shift from Intelligence to Life

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

In 2005, group members in the System Design COE program conducted robust discussions with a wider view toward "System Life." Additionally, the various basic technologies of "System Life" itself or basic technologies for supporting "System Life" were developed. Systematization of the concept of "System Life" across four sub-groups, namely the *Sustainable Building as System Life* group, the *Autonomous-Cooperative Robotics* group, the *Energy and Bio-System for Life Design* group, and the *Symbiotic Production System* group was done in a cross-disciplinary way. Following is each group's achievements in 2005.

The *Sustainable Building as System Life* group built simulation platforms as well as sensing platforms based on grid technology that controls, so to speak, the brain and nerves of buildings. It also studied methods of designing "System Life" for metropolitan residential environments to autonomously cope with global environmental issues; tools for design were also developed. Overall, the *Sustainable Building as System Life* group achieved steady results, such as methods of design of symbiotic buildings, methods of assessing environmental impact on sustainable buildings as "System Life," applications to smart structure systems, creation of sustainable structural systems with neural networks, and integrating urban and architectural space into "System Life."

The *Autonomous-Cooperative Robotics* group achieved results that are closely related to "System Life." Among the achievements are the following: establishment of control methods of mechanical systems such as bipedal robots, humanoids, and a guide robot "KEITA" who acts in harmony with humans; establishment of hierarchical feedback mechanisms by tactile sensation; development of power assist control methods for electrical vehicles; and proposals for new adaptive control methods.

The *Energy and Bio-System for Life Design* group obtained vital results that became the basis for system designs toward "System Life." Such vital achievements were completed through research on cellular and tissue micro/nano biomechanics and system integration, research on transfer phenomena sensing and control of energy devices, and remote sensing of micro/nano scale thermophysical properties.

The *Symbiotic Production System* group also produced results that are essential for the basis of system designs toward "System Life." This group established a framework for designing "System Life" by using hierarchical design models, and also developed technologies of "System Life" for industrial processing systems.

In response to the results of the interim evaluation in 2005 by the Ministry of Education, Culture, Sports, Science and Technology, all the group members spent substantial amounts of time in discussing the future points of view of system design toward "System Life" as well as the future role of this organization in 2006.

As a result of these robust discussions, new groups have been formed such as the group to create "System Life" design methodologies and architecting. In addition, new projects have been started in order to achieve concrete results. Such projects are "Micro-scale Product Innovation" and "Human-scale Product Innovation." Those actions are taken with the purpose of further clarifying and renewing the organization.

Adding to the activities in 2005, research associate and post-doctoral hiring programs as well as the International Internship Program were carried out as part of the development of young researchers. The existing Advanced Design School offered three courses, namely Space System Design, Architecture System Design, and Product and System Design. As a part of this Advanced Design School program, an English lecture series given by internationally reputable lecturers was offered. In this Advanced Design School, potential for "System Life" designs was pursued from both research and educational perspectives, new fields were developed, and also researchers meeting international standards were nurtured. As for the International Internship Program in 2005, an RA from Imperial College in London was invited as a long-term intern. In addition, young researchers from the group were sent to various universities worldwide such as Harvard University, the Massachusetts Institute of Technology, the University of Pennsylvania, the University of Nebraska-Lincoln, and the University of Newcastle.

Furthermore, international symposiums were held resulting in active international exchanges. The details of the symposiums are as follows.

- July 8, 2005  
Workshop on Product and System Design
- October 1, 2005  
2nd International Symposium on Ecological Challenges in Manufacturing Systems

Other achievements that should be noted are the first place prizes in Robot Soccer World Competition achieved by soccer robots embedded with the concept of "System Life."

- League Champion: RoboCup2005 in Osaka, Middle Size League
- League Champion in Dribbling challenge: RoboCup2005 in Osaka, Middle Size League



# FY2005 Financial Position

Ended on March 31, 2006

## 1 Balance Sheet

		Million yen
<b>Assets</b>		
<b>Fixed assets</b>		<b>282,299</b>
Tangible fixed assets		181,302
Land		27,540
Buildings		88,467
Structures		4,891
Equipment and supplies for education and research		22,668
Other equipment and supplies		415
Books		35,685
Vehicles		17
Construction in progress		1,619
Other fixed assets		100,997
Land lease rights		4
Telephone subscription rights		72
Facility use rights		910
Deposits		2
Profit-making business capital		3,750
Long-term loans		2,461
Specified assets *1		53,126
School bond assets producing interest		6,073
Reserve assets for the third fund		34,600
<b>Current assets</b>		<b>63,326</b>
Cash deposits		23,895
Accounts receivable		13,355
Inventories		460
Negotiable securities		23,608
Assets for school trip deposits		113
Others		895
<b>Assets total</b>		<b>344,625</b>
<b>Liabilities</b>		
<b>Fixed liabilities</b>		<b>57,607</b>
Long-term borrowings		7,480
School bonds		4,239
Retirement allowance reserve		29,020
Pension reserve		16,868
<b>Current liabilities</b>		<b>29,506</b>
Short-term borrowings *2		2,180
School bonds *2		1,833
Accounts payable		10,848
Advances received		12,854
Deposits		1,677
School trip deposits		113
<b>Liabilities total</b>		<b>87,112</b>
<b>Funds</b>		
Funds		
First fund *3		273,238
Second fund *4		7,238
Third fund *5		34,600
Fourth fund *6		7,959
<b>Funds total</b>		<b>323,035</b>
<b>Balance of income and expenditure</b>		
Carried forward to next year		△65,522
<b>Total of liabilities, funds, and balance of income and expenditure</b>		<b>344,625</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 (Jukusan)" expected to be repaid in FY2006.

\*3 First Fund  
Funds related to the acquisition and maintenance of fixed assets (acquisition cost of fixed assets such school land, school buildings, equipment and supplies, books, etc. acquired by self-financing).

\*4 Second Fund  
Fund related to future acquisition of fixed assets (3.2 billion yen transferred in FY2005)

\*5 Third Fund  
Amount of assets related to scholarships and research funds.

\*6 Fourth fund  
Funds for payments; must be constantly maintained. (Transfers not necessary in FY2005 under accounting standards.)

Source: *Activities and Financial Position of Keio Gijuku: FY2005 Business Report*

## 2 Income and Expenditure Statement

			Million yen
<b>Income</b>	All of Keio (Keio Gijuku)	University only	
<b>Imputed income</b>			
Tuition and other student fees	43,876	36,204	
Other fees	2,296	1,999	
Donations*1	6,752	2,610	
Subsidies*2	12,847	9,349	
Income from asset management	5,265	247	
Income from business	7,484	7,096	
Income from medical services	41,621	0	
Miscellaneous income	2,874	2,562	
<b>Imputed income total</b>	<b>123,016</b>	<b>60,069</b>	
Transfer to capital fund	△ 10,123	△ 4,264	
<b>Income total</b>	<b>112,893</b>	<b>55,805</b>	
<b>Expenditure</b>	All of Keio (Keio Gijuku)	University only	
<b>Personnel</b>	<b>62,149</b>	<b>32,911</b>	
Expenses for education and research*3	52,702	26,976	
Expenses for general administration	3,921	1,239	
Interest on borrowings	199	100	
Loss on disposition*4	319	282	
Provision for allowance for doubtful accounts	84	21	
Discretionary reserve	-	-	
<b>Total expenditure</b>	<b>119,374</b>	<b>61,530</b>	
Current excess over expenditure	6,481	-	
Brought forward from last year	59,041	-	
Carried forward to next year	65,222	-	
<b>Imputed income total -</b>			
<b>Total expenditure</b>	<b>3,642</b>	<b>△ 1,460</b>	

\*1 Donations  
Includes contributions in goods.

\*2 Subsidies  
In FY2005, subsidies from the Promotion and Mutual Aid Corporation for Private Schools in Japan (PMAC) totaled ¥9,356,336,000. General subsidies account for ¥6,535,358,000 of this amount and special subsidies account for ¥2,814,978,000. Subsidies allocated to individual researchers, such as subsidies for the 21st Century COE Programs and Grants-in-Aid for Scientific Research (*Kakenhi*), etc., are considered deposits of the school juridical organization. These subsidies, direct research expenses, which take up the bulk of these subsidies, are not included in the subsidies of the financial statement, which are considered imputed income. Accordingly, expenditures corresponding to these subsidies are also excluded from expenditures for education and research.

\*3 Expenses for education and research  
Research activities funded by subsidies such as Grants-in-Aid for Scientific Research (*Kakenhi*) are not included (please see \*2 above)

\*4 Loss on disposition  
Most of the loss on disposition in this period is loss on disposal of fixed assets.

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

Source: *Activities and Financial Position of Keio Gijuku: FY2005 Business Report*

# Research-related Facilities and Libraries

## Research Space for Rent

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

As of July 2006

Facility	Outline	For Inquiries
Research Space at the KLL (See pages 9-10)	Total of 32 rooms in <i>Sousoukan</i> Building on Yagami Campus Size: 66.12m <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. +81-45-566-1470 E-mail: 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 http://www.kll.keio.ac.jp/liaison/index.html
Shin-Kawasaki Town Campus (See pages 15-16)	K-Building: 1,388.25m <sup>2</sup> Shin-Kawasaki Building: 1,388.25m <sup>2</sup> I-Building: 1,171.36m <sup>2</sup> O-Building: 1,388.25m <sup>2</sup>	Shin-Kawasaki Town Campus Shin-Kawasaki Keio Frontier Research and Education Collaborative Square Tel. +81-44-580-1580 E-mail: k2-tc@adst.keio.ac.jp http://www.k2.keio.ac.jp
Shinanomachi Research Park (See pages 11-12)	56 units in the Institute of Integrated Medical Research Building Outline: Steel frame with a reinforced concrete structure; 2 under ground floors, 9 above ground floors, and one penthouse floor Size: 96m <sup>2</sup> - 124m <sup>2</sup> ; 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/index.html
Keio Fujisawa Incubation Village (SFC-IV) (See page 14)	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: 5; server room: 1	Keio Fujisawa Innovation IM Room Tel. +81-466-49-3910 E-mail: tsuji-y@smrj.go.jp http://www.sfc-iv.jp/8.html
Tsuruoka Metabolome Campus (Tsuruoka Leading-Edge Research Industrial Support Center - not a Keio facility.) (See page 18)	29 units, Size: 7m x 10m x 2.8m Steel frame structure, 2 floors Total floor area: approximately 3,700m <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.lg.jp/ (HP of Tsuruoka City) http://www.city.tsuruoka.yamagata.lg.jp/

## 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, 2006

	Book Stocks	Collections by Material Type					Electronic Media			Number of Seats
	Total	Domestic Books	Foreign Books	Domestic Journals	Foreign Journals	Notebook Materials (items)	Electronic Journal Titles	Number of Databases	Number of Electronic Book Titles	
Mita Media Center	2,519,911	899,732	988,656	231,402	273,359	126,762				1,104
Hiyoshi Media Center	758,108	413,396	203,509	47,288	62,856	31,059				1,314
Medical Media Center (Shinanomachi)	386,219	60,706	49,684	85,511	183,003	7,315				168
Information and Media Center for Science and Technology (Yagami)	344,514	87,663	42,094	54,438	157,190	3,129				373
Shonan Fujisawa Media Center	378,340	197,657	92,502	40,986	22,865	24,330				917
<b>Total</b>	<b>4,387,092</b>	<b>1,659,154</b>	<b>1,376,445</b>	<b>459,625</b>	<b>699,273</b>	<b>192,595</b>	<b>27,699</b>	<b>211</b>	<b>2,458</b>	<b>3,876</b>



Old University Library at Mita Campus



Shonan Fujisawa Media Center



Shinanomachi Media Center

# Research Funds at Keio University in FY2005

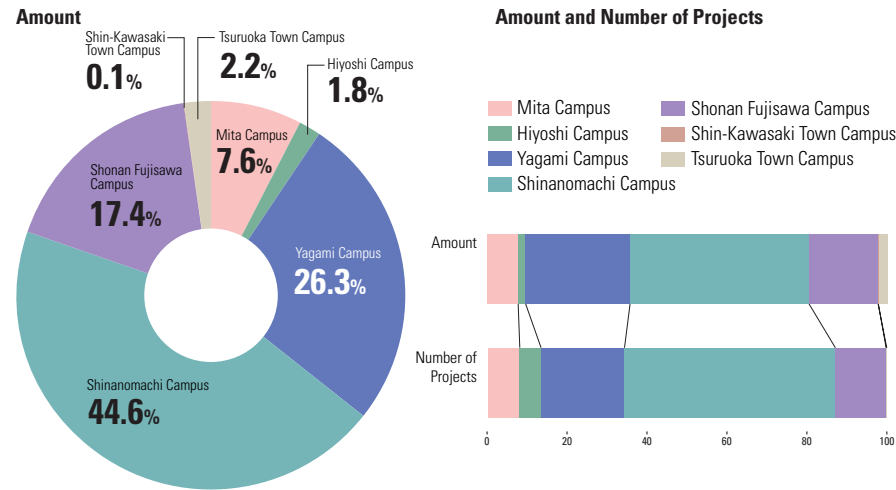
Research funds at Keio University from national and local public institutions, private businesses, and university funding, etc., totaled approximately ¥14.5 billion in FY2005. The funds include those for the 21st Century COE Program for which Keio University won 12 projects, the largest number for a private university. Other funds include the Special Coordination Fund for the Promotion of Science and Technology "Program to Encourage the Development of Strategic Research Centers," of the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

In the following, data on research funds is categorized by campus, affiliation of researcher, type of funds, and field of research.

## 1. Research Funds by Campus

The following figures are tabulated from the research funding data administered by the Office of Research Administration of each campus.\* The Shinanomachi campus (home of the Medical School and the Graduate School of Medicine) came in first in both the amount and the number of projects, while the Yagami Campus (home of the Faculty of Science and Technology) came in second in both categories.

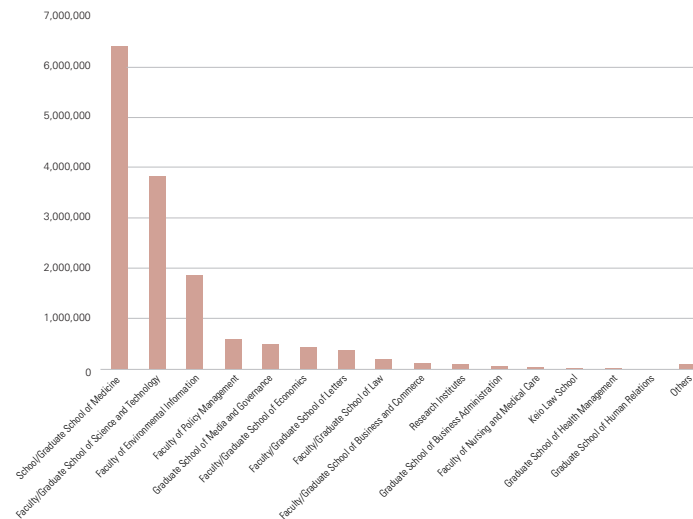
\*Research may actually take place at different campuses.



Campus	Number of Projects	Amount
Mita Campus	281	1,103,397
Hiyoshi Campus	192	265,589
Yagami Campus	737	3,825,455
Shinanomachi Campus	1,865	6,502,209
Shonan Fujisawa Campus	450	2,539,560
Shin-Kawasaki Town Campus	3	7,245
Tsuruoka Town Campus	8	323,047
<b>Total</b>	<b>3,536</b>	<b>14,566,502</b>

## 2. Research Funds by Affiliation of Researchers

The table on the right shows the number of projects and the amount allocated according to the affiliation of the researcher. In both the number of projects and the amount, the School/Graduate School of Medicine comes out on top of the list, followed by the Faculty/Graduate School of Science and Technology.



Affiliation of Researcher	Number of Projects	Amount
Faculty/Graduate School of Letters	124	375,726
Faculty/Graduate School of Economics	92	429,177
Faculty/Graduate School of Law	76	181,265
Faculty/Graduate School of Business and Commerce	67	117,122
School/Graduate School of Medicine	1,867	6,406,141
Faculty/Graduate School of Science and Technology	741	3,827,755
Faculty of Policy Management	89	580,141
Faculty of Environmental Information	288	1,856,064
Faculty of Nursing and Medical Care	29	37,097
Graduate School of Human Relations	0	0
Graduate School of Business Administration	23	59,448
Graduate School of Media and Governance	53	486,806
Keio Law School	23	17,235
Graduate School of Health Management	1	500
Research Institutes	52	94,715
Others	11	97,310
<b>Total</b>	<b>3,536</b>	<b>14,566,502</b>

## 3. Research Funds by Type

The number of projects funded by specified contributions results in the largest of all when compared to the other types of funding. Funds from subsidies come first in terms of amount. Funds from subsidies, commissioned research, specified contributions, and joint research account for approximately 90% of the total research funds.

### 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.

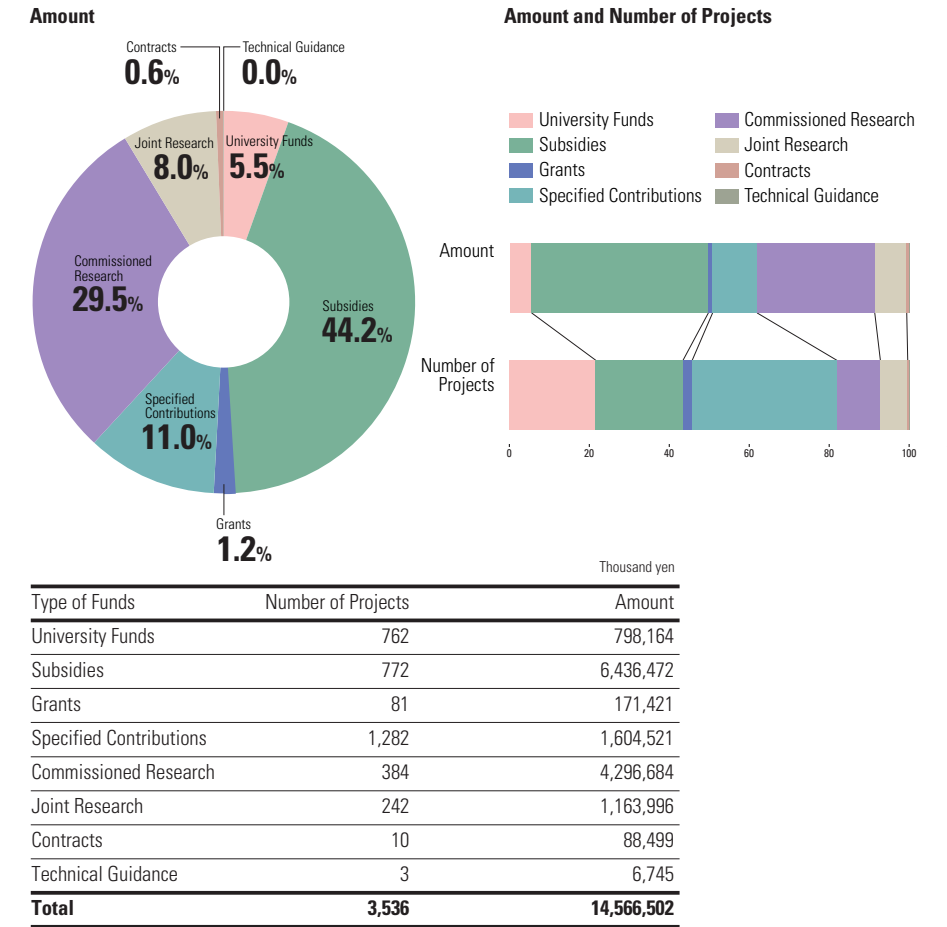
**Specified Contributions:** Contributions earmarked for research activities.

**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.



## 4. Subsidies not included in Imputed Income

Some of the subsidies to the university appear as imputed income of school accounts in the financial statement but others do not. The amount of imputed income in FY2005 was ¥12,847 million (please see Income and Expenditure Statement, p.31).

The amounts not imputed to income are as follows:

Type	Amount received (△: returned due to termination of project, change of affiliation, etc.)	Other income		Expenditures	Commissioned to external organizations (as part of expenditures)
		Received from other organizations	Interest		
Grants-in-Aid for Scientific Research ( <i>Kakenhi</i> ) (MEXT)	2,329,978 △120,533	29,079	10	* 2,237,874	39,622
Health and Labour Sciences Research Grant (MHLW)	772,397 △300	11,900	1	783,998	202,750
21st Century COE Program	1,684,100	0	5	1,684,105	0
<b>Total</b>	<b>4,665,642</b>	<b>40,979</b>	<b>16</b>	<b>4,705,977</b>	<b>242,372</b>

\*Excluding amounts carried over to following year

These amounts, such as Grants-in-Aid for Scientific Research, are subsidies given to individual researchers, so in the financial statement they are not classified as "subsidies" but rather as "deposits." However, these subsidies are included in ¥6,436 million shown as subsidies in the table "Research Fund by Type" above. Indirect expenses corresponding to the direct research expenses shown above are as follows:

The amounts not imputed to income are as follows:

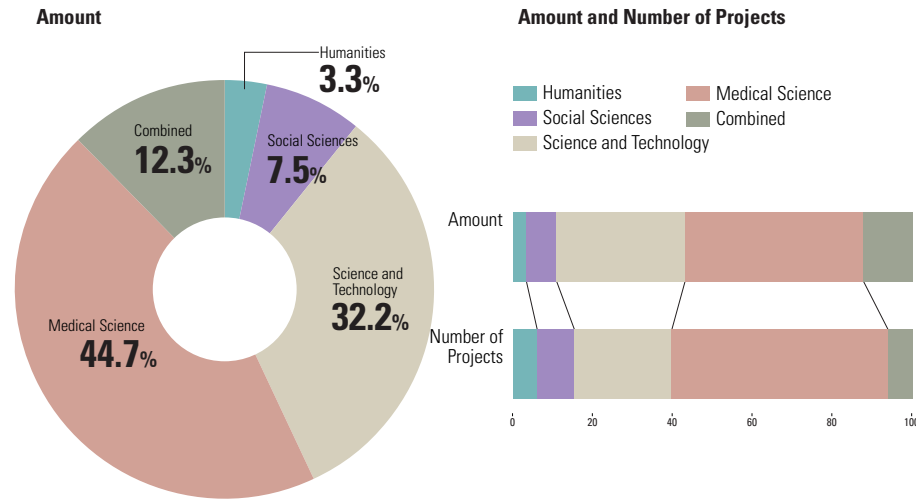
Grants-in-Aid for Scientific Research ( <i>Kakenhi</i> ) (MEXT)	Health and Labour Sciences Research Grant (MHLW)	21st Century COE Program	Total
<b>224,610</b>	<b>23,311</b>	<b>67,000</b>	<b>314,921</b>

Source: *Activities and Financial Position of Keio Gijuku: FY2005 Business Report*

Indirect expenses are managed by government agencies, so they are classified as "miscellaneous income" in the financial statement. They are included as "indirect expenses" on p.36.

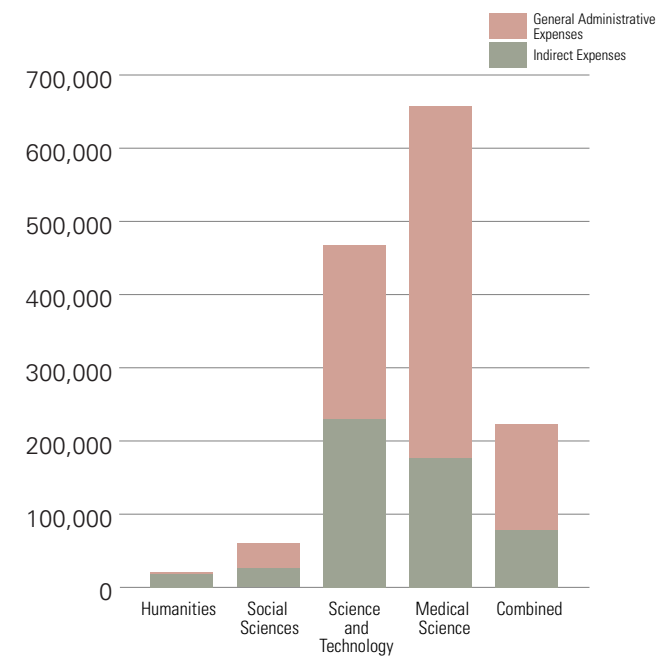
## 5. Research Funds by Field

The data in this section are compiled with reference to classification of the field of research in other official reports such as the *Survey of Research and Development* by the Ministry of Internal Affairs and Communications, and various surveys on research expenses by the Japan Association of Private Colleges and Universities. The field of medical science came in first in the number of projects and amount.



Field	Number of Projects	Amount
Humanities	210	472,903
Social Sciences	331	1,098,270
Science and Technology	862	4,693,595
Medical Science	1,919	6,503,613
Combined	214	1,798,121
<b>Total</b>	<b>3,536</b>	<b>14,566,502</b>

## Indirect Expenses and General Administrative Expenses



Field	Indirect Expenses	General Administrative Expenses
Humanities	18,280	2,575
Social Sciences	25,830	35,000
Science and Technology	229,888	237,799
Medical Science	177,035	480,326
Combined	78,758	143,623
<b>Total</b>	<b>529,791</b>	<b>899,323</b>

### Definition

#### Humanities:

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

#### Social Sciences:

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

#### Science and Technology:

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

#### Medical Science:

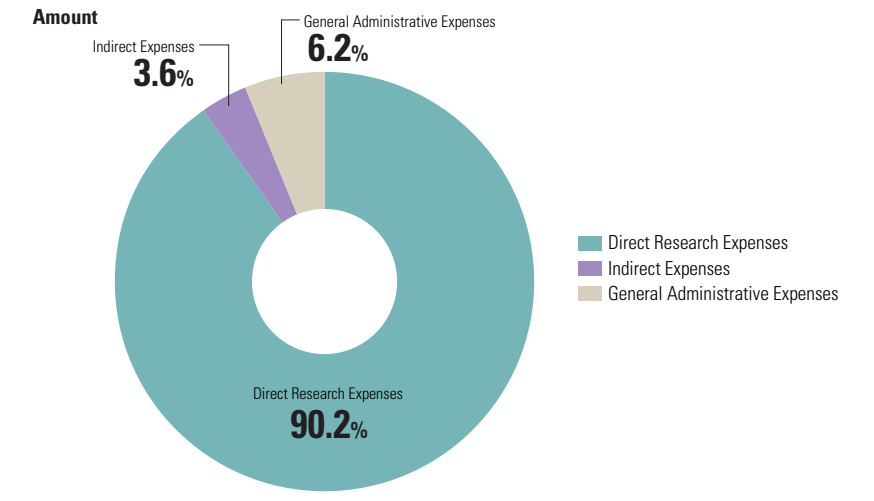
Medicine, Nursing, Pharmaceutical Science, and other health and medical sciences.

#### Combined:

Interdisciplinary fields.

## 6. Ratio of Direct Research Expense to Research Funds

By dividing research funds into direct research expense, indirect research expense, and general administrative costs, the ratio of direct research expense to research funds is calculated to be approximately 90 percent.



Total Research Expense		
14,566,502		
Direct Research Expenses	Indirect Expenses	General Administrative Expenses
13,137,388	529,791	899,323

### Definition

#### Indirect Expenses:

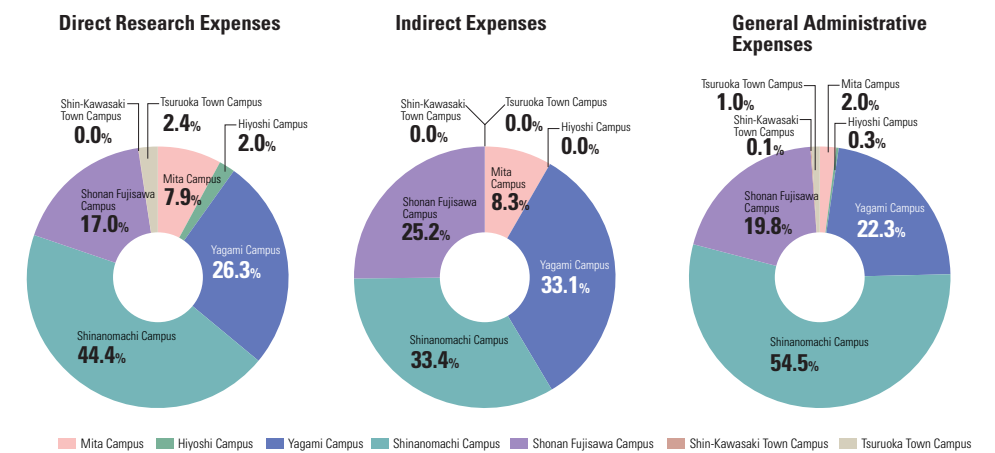
Expenses provided equivalent to a certain percentage of the competitive research funds in addition to the direct expenses for the research to supplement administrative and operational costs of the institution to which a researcher is affiliated.

#### General Administrative Expenses:

Expenses provided to supplement administrative costs for research other than direct expenses for the research.

## 7. Direct Research, Indirect, and General Administrative Expenses by Campus

Shown in the graphs and a table on the right is a breakdown by campus of direct research expenses, indirect expenses, and general administrative expenses. As with research funds, the Shinanomachi Campus (School/Graduate School of Medicine) came in first, while the Yagami Campus (Faculty of Science and Technology) came in second.



Campus	Direct Research Expenses	Indirect Expenses	General Administrative Expenses
Mita Campus	1,041,152	44,110	18,135
Hiyoshi Campus	262,765	0	2,824
Yagami Campus	3,449,484	175,415	200,556
Shinanomachi Campus	5,835,613	177,035	489,561
Shonan Fujisawa Campus	2,228,395	133,231	177,934
Shin-Kawasaki Town Campus	6,158	0	1,087
Tsuruoka Town Campus	313,821	0	9,226
<b>Total</b>	<b>13,137,388</b>	<b>529,791</b>	<b>899,323</b>

# Competitive Research Funds and the University's International Competitive Capability

For universities, the weight of competitive research funds over external research funds is increasing. On March 28, 2006, the Cabinet passed the 3rd Science and Technology Basic Plan, a five-year plan (FY2006-2010) for the nation that will provide approximately 25 trillion yen in government R&D expenditure.

In 2006, the first year of the Basic Plan, the budget related to Science and Technology expenditures is 3.6 trillion yen, of which 470 billion yen is allocated as competitive research funds (an increase of 6.2% over the previous year). The total amount budgeted for competitive research funds by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) is 358 billion yen (including estimates for administration). Within this budget, the greatest amount is 190 billion yen for Grants-in-Aid for Scientific Research (*Kakenhi*), an increase of 1.5 billion yen, or 7%, over the previous year). Next are the 48 billion yen provided for Basic Research Programs (operated by the Japan Science and Technology Agency) and the 39.8 billion yen for the MEXT Special Coordination Funds for Promoting Science and Technology. Besides MEXT, the other ministry providing large-scale competitive funding is the Ministry of Health, Labour and Welfare, which has budgeted 42.8 billion yen for Health and Labour Sciences Research Grants.

The rate and amount of winning competitive research funds can be said to be an indicator of a university's research potential. The national universities (91 corporations including institutions that share use of the four major national universities), being better funded with government subsidies for administration and maintenance of facilities, and thus having better research facilities, have long been ahead of private universities, which number just over 700 and have about 80% of the undergraduate and graduate student population, in terms of both award selection and amount.

While competition between universities for research funds grow more intense domestically, the 3rd Science and Technology Basic Plan specifies to organizations aiming to become world-class research centers that strategic investments will be given under the principle of market competition.

The achievements of Keio University in such an intense environment are introduced below. First, Keio's ranking in winning MEXT's Grants-in-Aid for Scientific Research (*Kakenhi*), representative of competitive research funds, is shown with other institutions. Next, Keio's achievements in exchanges with overseas universities and research institutions, which are essential for increasing its international competitiveness, are presented.

\* Competitive research funds: "Fund for research and development to be distributed to researchers and institutions making proposals on a subject publicly announced and passing the examination based primarily on scientific and technological perspectives, by a committee composed of more than two members including experts in the subject field." (*Reform of the Competitive Research Funding System*, Council for Science and Technology Policy, April 2003)  
 \* Source: Ministry of Education, Culture, Sports, Science and Technology homepage "The 3rd Science and Technology Basic Plan" [http://www.mext.go.jp/a\\_menu/kagaku/kihon/06032816/001/001.pdf](http://www.mext.go.jp/a_menu/kagaku/kihon/06032816/001/001.pdf)

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

*Kakenhi* is designed to remarkably develop any academic research, from basic to applied, in fields ranging from humanities and social sciences to the natural sciences, based on the free thinking of individual researchers. The grants are meant to be provided, after peer review, to innovative and pioneering research projects. In FY2005, due to the relaxation of application requirements, the *Kakenhi* were granted for approximately 52,000 research subjects out of total 125,000 applications (an increase of 12,000 applications compared to the previous year).

The table shows the number of *Kakenhi* projects adopted (new and those continuing from the previous year) and the amounts distributed (at the time of selection, different from the data on page 32) of the top 20 institutions from FY2003 to FY2005. The aggregate of the top 10 accounts for about 45% of the total, and that of the top 20 for about 56%. Keio University was ranked 11th overall and first among private universities, with the amount distributed equivalent to 1% of the total.

### *Kakenhi* Distributed by Institution

Rank	FY2003			FY2004			FY2005				
	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	2,501	18,751	University of Tokyo	2,676	22,101	University of Tokyo	2,750	18,088		
2	Kyoto University	1,820	9,370	Kyoto University	2,031	12,244	Kyoto University	2,170	11,339		
3	Osaka University	1,484	7,487	Osaka University	1,592	9,243	Osaka University	1,627	8,262		
4	Tohoku University	1,542	6,889	Tohoku University	1,599	8,475	Tohoku University	1,679	8,079		
5	Nagoya University	1,008	5,474	Nagoya University	1,079	6,722	Nagoya University	1,212	5,781		
6	Hokkaido University	1,103	4,920	Kyushu University	1,287	5,415	Hokkaido University	1,312	5,334		
7	Kyushu University	1,202	4,535	Hokkaido University	1,183	5,347	Kyushu University	1,347	5,138		
8	Tokyo Institute of Technology	705	4,008	Tokyo Institute of Technology	757	4,160	Tokyo Institute of Technology	761	4,278		
9	University of Tsukuba	709	2,530	University of Tsukuba	741	2,611	University of Tsukuba	850	2,760		
10	Hiroshima University	753	2,130	Hiroshima University	842	2,403	Kobe University	735	2,343		
11	Keio University	539	1,961	Keio University	578	2,227	Keio University	585	2,320		
12	Kobe University	558	1,735	Kobe University	669	2,216	RIKEN	478	2,312		
13	RIKEN	381	1,609	RIKEN	437	2,149	Hiroshima University	836	2,245		
14	Okazaki National Research Institutes	175	1,566	Chiba University	538	1,858	Okayama University	600	1,776		
15	Okayama University	563	1,501	Okayama University	608	1,695	Tokyo Medical and Dental University	372	1,749		
16	Chiba University	467	1,378	Tokyo Medical and Dental University	364	1,494	Chiba University	572	1,698		
17	Tokyo Medical and Dental University	360	1,354	Waseda University	460	1,422	Kumamoto University	391	1,448		
18	National Institute of Genetics	60	1,311	National Institute of Genetics	71	1,422	Waseda University	503	1,409		
19	Kumamoto University	340	1,168	Kumamoto University	348	1,241	Kanazawa University	450	1,277		
20	Kanazawa University	419	1,137	Tokyo Metropolitan University	266	1,151	Niigata University	489	1,227		
A			126,341	B			155,051	C			158,892
B			66,094	B/A			78,721	C/A			71,402
B/A			52%	C			51%	C/A			45%
C			80,814	C/A			95,596	C/A			88,863
C/A			64%	C/A			62%	C/A			56%

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

## 2 International Exchange and Collaboration

### Further Internationalization of the University

Keio University, inheritor of founder Yukichi Fukuzawa's tenet, "To be trailblazer of society" aims to achieve international standards with the following themes: "implementing visceral education," "creating intellectual value," and "breaking new grounds in industry."

In January 2005, Keio University established the Organization for Global Initiatives (OGI) to strategically pursue international exchange and collaboration university-wide.

### Exchange of Researchers and Students

	No. of Partner Institutions	Incoming		Outgoing	
		No. of Students	No. of Researchers	No. of Students	No. of Researchers
Asia	31	568	78	14	3
Middle East	2	3	7	2	1
Africa	-	4	4	2	-
Oceania	6	6	2	9	-
North America	42	54	31	55	87
Middle and South America	4	8	6	0	2
Europe	69	81	46	76	39
International Organizations	3	(10)	/	/	/
<b>Total</b>	<b>157</b>	<b>724</b>	<b>174</b>	<b>158</b>	<b>132</b>

Source: OGI  
 Data based on university authorized agreements only.  
 Number of partner institutions as of March 2006.  
 Number of students and researchers as of May 2005.  
 ( / ) indicates head-counts for Each Region.

### Internationalization of Research

Along with the increase of student exchanges between universities, "the internationalization of research" is proceeding in parallel, as the percentage of papers authored jointly with researchers from other countries is growing greatly. At Keio University, in addition to exchanges stemming from agreements at the school level as described above, research centers, institutes, laboratories, etc, including those in the 21st Century COE program are increasing international exchanges at the project and organization level.

### English Publications Issued by Keio University Research Centers

#### The 21st Century COE Research Programs

#### Development of a Theory of Market Quality and an Empirical Analysis Using Panel Data (p.25)

\* Jointly published with Kyoto University's 21st Century COE Program "Formation of Interfaces in Advanced Economic Analysis"

*International Journal of Economic Theory* Blackwell Publishing

<http://www.ijet.jp/>

*Asian Economic Papers* MIT Press

<http://www.mitpressjournals.org/loi/asep>

#### Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World (p.26)

*Journal of Political Science and Sociology*

<http://www.coe-ccc.keio.ac.jp/en/journal/>

#### Policy Innovation Initiative: Human Security Research in Japan and Asia (p.26)

*Policy and Governance Working Paper Series*

<http://coe21-policy.sfc.keio.ac.jp/en/wp/index.html>

#### Institute for Media and Communication Research (p.5 Mita Campus)

*Keio Communication Review*

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

#### Global Security Research Institute (G-SEC) (p. 7 Mita Campus)

*Global Security Research Institute Working Papers (GWP)*

[http://www.gsec.keio.ac.jp/wp\\_e.html](http://www.gsec.keio.ac.jp/wp_e.html)

#### School of Medicine (p.11-12 Shinanomachi Campus)

*The Keio Journal of Medicine*

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

The president of the University serves as the executive director of OGI. The Organization was selected by the Ministry of Education, Culture, Sports, Science and Technology as part of its Strategic Fund for Establishing International Headquarter in Universities program.

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



There were 157 research exchanges (joint researches, sponsorships of international symposia, personnel exchanges, etc) with overseas universities and research institutions in arrangements separate from the overall university exchange agreements. (Tabulation is based on the achievements of the 48 centers that responded to a survey.\*) Partnerships by region ranks as follows: Asia, North America, Central America, and Europe.)

\* Conducted in June 2006 by Annual Report on Research Activities Publication Committee

### Citation of Papers Authored by Keio University Researchers

	Rank	Number of papers	Index
Combined	45	3748.1	107.0
Material Science	9	169.6	120.1
Chemistry	14	628.0	106.5
Biology/Biochemistry	9	223.4	129.5
Molecular biology / Genetics	5	134.6	140.6
Immunology	11	58.1	113.9
Pharmaceuticals	5	31.6	119.3
Psychiatry / Psychology	3	32.5	122.9
Humanities / Social Sciences	9	83.0	106.7

Source: Based on "Ranking of Japanese Universities" (2007); Asahi Shimbun Co.

# Researchers at Keio University in FY2005

This section presents data on researchers involved in research or 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.

## Number of Researchers

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

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

In contrast to Mita and Hiyoshi campuses, there are more researchers funded by external research sources at the Yagami, Shinanomachi, and Shonan Fujisawa campuses. The number of the non-tenured researchers (that is, the total number of researchers with fixed period contracts and special research professors) accounts for 22% overall, but is a striking 49% at Shonan Fujisawa Campus.

Campus	Tenured Researchers	Researchers with Fixed Period Contract	Special Research Professors	Total
Mita	359	46	49	454
Hiyoshi	295	18	1	314
Yagami	242	18	45	305
Shinanomachi	498	6	121	625
Shonan Fujisawa	134	40	89	263
<b>Total</b>	<b>1,528</b>	<b>128</b>	<b>305</b>	<b>1,961</b>

As of 1 May 2006

## 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

Course Doctorate	
Graduate School of Letters	6
Graduate School of Economics	6
Graduate School of Law	5
Graduate School of Human Relations	4
Graduate School of Business and Commerce	6
Graduate School of Medicine	31
Graduate School of Science and Technology	85
Graduate School of Business Administration	2
Graduate School of Media and Governance	26
<b>Subtotal</b>	<b>171</b>

Dissertation Doctorate	
Graduate School of Letters	2
Graduate School of Economics	0
Graduate School of Law	5
Graduate School of Human Relations	2
Graduate School of Business and Commerce	9
Graduate School of Medicine	66
Graduate School of Science and Technology	12
Graduate School of Business Administration	0
Graduate School of Media and Governance	2
<b>Subtotal</b>	<b>98</b>

**Total** **269**

As of 31 March 2006

## Number of Students Registered in Doctoral Courses

Graduate School of Letters	< 45>	119
Graduate School of Economics	< 15>	68
Graduate School of Law	< 30>	103
Graduate School of Human Relations	< 11>	46
Graduate School of Business and Commerce	< 20>	47
Graduate School of Medicine *	< 68>	192
Graduate School of Science and Technology	<150>	345
Graduate School of Business Administration	< 8>	12
Graduate School of Media and Governance	< 50>	161
<b>Total</b>		<b>1,093</b>

As of 1 May 2005

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.

## 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
Research Associates of Faculty of Science and Technology (Yagami)	49	Researchers participating in research without a contract of commissioned research.
Researchers of Keio Leading-edge Laboratory of Science and Technology (KLL) (Yagami)	144	Researchers participating in research under a commissioned research contract.
School of Medicine Researcher (Shinanomachi)	51	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)	249	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)	129	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)	327	
Others (See Table B)	1,142	
<b>Total</b>	<b>2,091</b>	

## Table A: Visiting Professors and Researchers

Job Title, Status	Mita/Hiyoshi	Yagami	Shinanomachi	Shonan Fujisawa	Total
Visiting Professor	26	29	11	0	66
Visiting Associate Professor	7	12	15	1	35
Visiting Lecturer	5	12	13	0	30
Visiting Research Fellow	44	58	80	0	182
Visiting Research Associate	8	4	2	0	14
<b>Total</b>	<b>90</b>	<b>115</b>	<b>121</b>	<b>1</b>	<b>327</b>

## Table B: Others

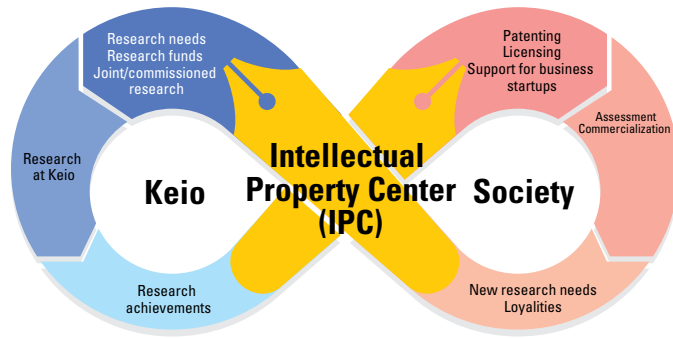
Research Institute	No. of Researchers at Keio University*2	No. of Researchers not Employed by Keio	Total
Institute of Cultural and Linguistic Studies (Mita)	30	42	72
Institute for Media and Communications Research (Mita)	12	47	59
Keio Economic Observatory (Mita)	34	29	63
<i>Shida Bunko</i> , Institute of Oriental Classics (Mita)	9	3	12
International Center (Mita)	55	22	77
Teacher Training Center (Mita)	31	42	73
Fukuzawa Memorial Center for Modern Japanese Studies (Mita)	23	37	60
Institute of East Asian Studies (Mita)	24	34	58
Center for Japanese Studies (Mita)	12	35	47
Research Center for the Arts and Arts Administration (Mita)	21	14	35
Global Security Research Institute (G-SEC) (Mita)	62	31	93
Research Institute for Digital Media and Content (DMC) (Mita)	102	38	140
Institute of Physical Education (Hiyoshi)	20	38	58
Health Center (Hiyoshi)	23	2	25
Keio Research Center for Foreign Language Education (Hiyoshi)	51	6	57
Sports Medicine Research Center (Hiyoshi)	10	7	17
Keio Research Center for the Liberal Arts (Hiyoshi)	177	19	196
<b>Total</b>	<b>696</b>	<b>446</b>	<b>1,142</b>

Figures show the totals for FY2005. Place names in parentheses indicate location of the institution.

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

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

# Technology Transfer: Activities at the Intellectual Property Center



Knowledge created at Keio University is transferred to society in the form of education and academic presentations. The university's knowledge is returned to society through students in the case of education, and as research information in the case of academic presentations. In addition to these traditional methods, technology transfers also include new activities in which accumulated knowledge is transferred to society in more concrete form, as products and technologies.

At Keio University, these technology transfers are promoted by the Intellectual Property Center, which protects knowledge and research results accumulated by the University as intellectual property. As the core of the University's intellectual assets, these intellectual properties are transferred to the industrial world in the form of licensed technologies, joint research between industry and academia, and the establishment of venture companies.

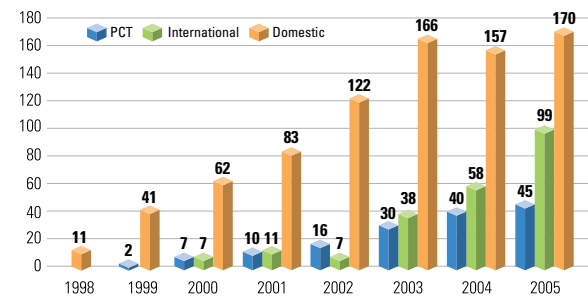
As a result of the high level of research at Keio University and the avid support of researchers, large numbers of invention proposals are received from all of the campuses. Technology transfers have given rise to extremely significant results, some of which are outlined below.

## 1 Intellectual Property

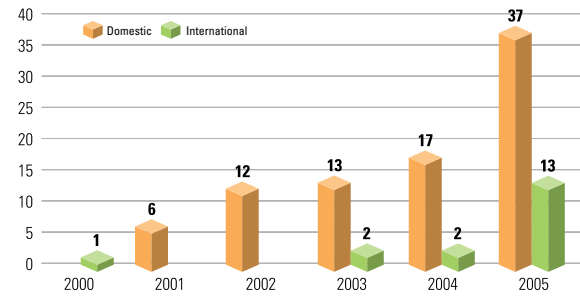
During the 2004 academic year, the IPC remained active as in the previous year, filing 170 domestic patent applications, 45 Patent Cooperation Treaty (PCT) applications, and 99 international patent applications. Particularly notable is the increase in international applications, as is the dramatic increase in the number of patent rights acquired. According to patent statistics published by the Japan Patent Office, Keio University was No. 1 in terms of both the number of registered patents by university and the number of unexamined patents published.

Following is the status of patent applications by field of technology, campus, and inventor.

### (1) Patent Applications



### (2) Registered Patents



### (3) Proportion of Applications by Field of Technology (2005)

Bio/ Medical	47%
Information/ Communication	19%
Control/ Measurement	19%
Materials/ Chemicals	15%

### (4) Number of Applications by Campus (2005)

Yagami (Faculty of Science and Technology)	108
Shinanomachi (School of Medicine)	42
SFC	19
Mita	1
<b>Total</b>	<b>170</b>

### (5) Total Patent Applications by Inventor

Professor	146	Associate Professor	50
Lecturer	27	Instructor/Assistant	64
Student	130	Staff Member	7
Other	152		

Each year, new submitters account for 20% of inventors, which is evidence of the expanding fields of invention activities at Keio University.

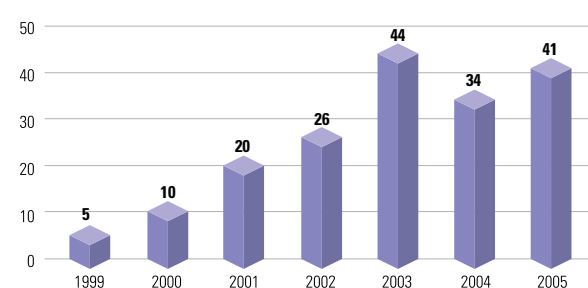
## 2 Technology Transfer

Technology transfers are conducted in the following three forms:

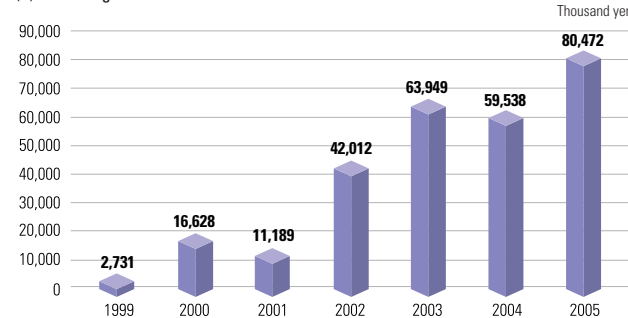
- (I) Licensing of Keio University's intellectual property to companies
- (II) Joint research with companies based on Keio University's intellectual property
- (III) Startups based on Keio University's intellectual property, and continuation of development activities in that company

The following graphs show the status of technology transfer in each of the above categories.

### (1) Number of New Licensing Agreements



### (2) Licensing Revenues



### (3) Startups and New Products Created Using IP Rights Owned by Keio

In 2005, Keio created five new startups: STAC K.K., GSP Kenkyusho K.K., K.O. Immuno Tec. K.K., Glyco Medics K.K., and Pharmish K.K., bringing the total number of startups based on Keio's Intellectual property to 14.

Also, in 2005, 15 new products were developed based on IP rights owned by Keio.

### (4) Joint research started based on intellectual property, and research funds obtained

The Intellectual Property Center actively promotes joint research with private-sector companies as well as the acquisition of public research and development funds, including the NEDO Grant for Practical Application of University R&D Results under the Matching Fund Method and the Japan Science and Technology Agency Key Region Research and Development Promotion Operation "Seeds Cultivation Experiment."

The joint research funds obtained based on Keio's Intellectual Property in 2005 totaled about one billion yen for 34 projects. Of this total, 440 million yen was related to matching funds or other public funds.

## 3 Platform for Information Exchange between Industry and Academia

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

The Intellectual Property Center held the "Keio Innovation Network" every month during 2005, during which the inventors themselves gave presentations on a specified theme. It also holds "Keio Technology Transfer Forums" throughout the country to deepen exchanges of information with various regions. In addition to introducing the technologies developed at Keio

University, these forums provide an opportunity to better understand the technology needs of companies, and to strengthen interactive ties.

Other activities included an Intellectual Property Center Symposium and a "Venture Private Conference," which was held jointly by Nippon Technology Venture Partners Investment Operations Union and the Keio Research Institute at SVC.

Details of these activities are outlined below.

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

2nd (Apr. 21, 2005)	"Formation of 3D liver tissue using multi-porous membranes"	Ryo Sudo	Research Associate (non-tenured), Faculty of Science and Technology
	"Development of cell transplant methods using cell sheaths"	Keiichi Fukuda	Professor, School of Medicine
3rd (May 27, 2005)	"Development of advanced e-learning technologies"	Hiroaki Chiyokura	Professor, Graduate School of Media and Governance
	"The future of sports coaching, changed by sensor/Internet technologies"	Yuji Ohgi	Associate Professor, Graduate School of Media and Governance
4th (Jun. 28, 2005)	"Moisture measurement in solid polymer membranes for fuel cells using small RF coils"	Kuniyasu Ogawa	Assistant Professor, Faculty of Science and Technology
	"Evaluation of revolution accuracy in high-speed, small-diameter spindles"	Kimiyuki Mitsui	Professor, Faculty of Science and Technology
5th (Jul. 26, 2005)	"Remote melanoma (melanotic carcinoma) diagnostic systems"	Hiroshi Oka	Researcher/Physician, Faculty of Science and Technology
	"Promising optical treatment technologies"	Tsunenori Arai	Professor, Faculty of Science and Technology
6th (Oct 27, 2005)	"Method for estimating genetic networks from genetic profile data"	Shuichi Onami	Associate Professor (non-tenured), Faculty of Science and Technology
	"Development and application of bacteria computers"	Yasubumi Sakakibara	Professor, Faculty of Science and Technology
7th (Nov. 24, 2005)	"Precision metal hybrid nano-materials and their applications in electronics"	Kimihisa Yamamoto	Professor, Faculty of Science and Technology
	"New production approaches opened up by fine particles"	Keiji Fujimoto	Associate Professor, Faculty of Science and Technology
8th (Dec. 22, 2005)	"Next-generation IT opened up by SuperSQL"	Motomichi Toyama	Assistant Professor, Faculty of Science and Technology
	"High-speed handover methods in IPv6 Internet: next-generation IT opened up by IP mobility"	Fumio Teraoka	Professor, Faculty of Science and Technology
9th (Feb. 22, 2006)	"Development of new minimally invasive hematopoietic organ tumor treatment methods using bioactive substances"	Masahiro Kizaki	Assistant Professor, School of Medicine
	"Development and application of new photodynamic therapy drugs"	Kazunobu Toshima	Professor, Faculty of Science and Technology

### (2) Keio Technology Transfer Forum

Held on Aug. 31, 2005 at the Osaka Chamber of Commerce and Industry (Supported by Osaka Prefecture and METI Kansai)	"Application of metabolome analysis for mining gaseous signal transducers"	Makoto Suematsu	Professor, School of Medicine
	"Drug discovery using glycotechnology"	Toshinori Sato	Professor, Faculty of Science and Technology
	"Chemical Biology and Drug discovery"	Masaya Imoto	Professor, Faculty of Science and Technology
	"Stem cell Biology and Regenerative Medicine of the Central Nervous System"	Hideyuki Okano	Professor, School of Medicine

### (3) Venture Private Conference

This conference, held at the Mita Campus G-SEC on May 10-11 and Dec. 14-15, 2005, included presentations by venture managers on business strategies and the outlook for the future, as well as introductions of specific businesses.

### (4) Intellectual Property Center Symposium

1st: Held on Dec. 15, 2005  
At: Mita Campus, North Building Hall  
"Talking about our venture": Large venture corporation or venture company?  
DeNA Co., Ltd.; President: Tomoko Namba  
Propia K.K.; President: Hiroshi Hoshi  
Nippon Technology Venture Partners Investment Operations Union; Mr. Kazutaka Muraguchi  
Keio University SIV Entrepreneur Laboratory; Prof. Jiro Kokuryo  
Intellectual Property Center; Director: Prof. Keisuke Shimizu

2nd: Held on Mar. 24, 2006  
At: North Building Hall, Mita Campus  
"Incubation of Innovation in universities"  
Keynote speech: "Expectations for university-based venture companies and venture incubation at SBI"

Lecturer: Yoshitaka Kitao; CEO, SBI Holdings, Inc.  
Panel Discussion: "Talking about concepts for the transfer of knowledge at Keio University"  
Nomura Securities Co. Ltd., Public Welfare Corporation Support Section Chief, Satoshi Hirao  
School of Medicine; Headmaster's Assistant, Prof. Makoto Suematsu  
The Keio Leading-edge Laboratory of Science and Technology (KLL) Director: Prof. Yasuhiro Koike  
Keio Research Institute at SFC; Director: Prof. Jiro Kokuryo  
Intellectual Property Center; Director: Prof. Keisuke Shimizu

### (5) Tozai 4-University Government, Industry, and Academia Collaboration Forum

The Tozai 4-University Government, Industry, and Academia Collaboration Forum was held jointly by Waseda University, Doshisha University, Ritsumeikan University, and Keio University on March 10, 2006, at the Keidanren Kaikan Hall.  
Keynote Speaker: Yoshitoshi Kitajima; President and CEO, Dai Nippon Printing Co., Ltd.  
Panel Discussion: "Collaborations among Government, Industry, and Academia"  
Nippon Keidanren (Japan Business Federation); Mr. Akio Yamanoi  
Japan Chamber of Commerce and Industry; Special Advisor: Mr. Kenichi Sekiya  
Waseda University; Vice President Yoichi Muraoka  
Ritsumeikan University; Vice President Sadao Kawamura  
Doshisha University Intellectual Property Center; Director, Hajime Wada  
Keio University Intellectual Property Center; Director: Prof. Keisuke Shimizu

## 4 Intellectual Property Center Award/Education

### (1) Intellectual Property Center Award

The Intellectual Property Center Award was established in 2002 to promote the activities of the Intellectual Property Center within the University, and to communicate the University's new initiatives to society.

The Intellectual Property Center Award is presented to those who have (1) generated intellectual property owned by Keio University; (2) transferred IP from the University to society and developed practical applications; and (3) made significant contributions to the IPC's activities.



6th Intellectual Property Center Award

The 6th Award, in 2005, was presented to Prof. Hiroaki Chiyokura of the Graduate School of Media and Governance for his "Lecture Support System." The Award ceremony was held during the "Incubation of Innovation in universities" Symposium held on March 24.

### (2) Education

As in previous years, a course entitled "Introduction to Intellectual Property" was held on the Mita Campus for students of any faculty, to provide an opportunity for education regarding Intellectual Property.

# Awards for Research Activities, FY2005

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

Date Awarded (YY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2005/04/18	Tomoyoshi Soga (Associate Professor, Faculty of Environmental Information)	5th Japan Biotechnology Business Competition: 1st Place	For "Development of metabolome analysis technology using CE-MS (capillary electrophoresis/mass selection detector) and its application for the development of pharmaceuticals, diagnostics and functional foods	Japan Biotechnology Business Competition Steering Committee
2005/04/20	Haruma Kawaguchi (Professor, Faculty of Science and Technology) Hiroshi Handa (Guest Professor, School of Medicine)	2005 Education, Culture, Sports, Science, and Technology Minister's Award, Research Division; Science and Technology Fields	For "Research in the Development of Nano-affinity beads for the development of pharmaceuticals"	Minister of Education, Culture, Sports, Science, and Technology
2005/05/18	Akira Ishikawa (Professor Emeritus)	Honorary Doctorate, East China University of Politics and Law; People's Republic of China	For contributions to interactions between Japan and China over many years in the study of law	East China University of Politics and Law, People's Republic of China
2005/05/30	Koji Suzuki (Professor, Faculty of Science and Technology) and others	Japan Air Cleaning Association Award: Technology Award	For developing a "Formaldehyde Detector" for practical applications	Japan Air Cleaning Association
2005/05/31	Takahiko Tanahashi (Professor, Faculty of Science and Technology) and others	Japan Society for Computational Engineering and Science Award for Outstanding Papers	For "Numerical Analysis of Fluid Dynamics using Finite Volume Lattice Boltzmann Method", Japan Society for Computational Engineering and Science Journal (2004); Paper No.20040005 A353; February 23, 2004	Japan Society for Computational Engineering and Science
2005/06/1	Hideyuki Tokuda (Chairperson, Graduate School of Media and Governance, Professor, Faculty of Environmental Information)	Internal Affairs and Communications Minister's Monthly Award for Telecommunications; 2005	For outstanding contributions to the proliferation and development of telecommunications	Minister of Internal Affairs and Communications
2005/06/3	Ichiro Inasaki (Headmaster and Professor, Faculty of Science and Technology)	SME Frederick W. Taylor Research Medal	In recognition of excellence in research related to production technologies over many years, and outstanding contributions to the development of production technologies	Society of Manufacturing Engineers SME
2005/06/7	Yuji Nagasaka (Professor, Faculty of Science and Technology)	42nd National Heat Transfer Symposium; Best Paper Award	For "Dynamic Measurement of Surface Properties of Polymer Solutions Using Ripplon(2nd Report, Measurement of Surface Viscoelasticity)"	The Heat Transfer Society of Japan
2005/06/18	Saburo Yanagisawa (Professor Emeritus) Koji Suzuki (Professor, Faculty of Science and Technology) and others	Hitachi Environment Foundation 32nd Environment Award (1st Prize)	For "Establishment of International Standard Analysis Method for Nitrogen Oxides in Exhaust Gas"	Hitachi Environment Foundation and Nikkan Kogyo Shimbun Ltd.
2005/06/27	Yuichiro Anzai (President of Keio University and Professor, Faculty of Science and Technology)	Commandeur de l'Ordre des Palmes Académiques	For actively introducing French academic research to Japan, and for promoting interactions with French universities and other forms of cultural exchanges between France and Japan	The Republic of France
2005/07/13	Naoyuki Agawa (Professor, Faculty of Policy Management)	6th Yomiuri-Yoshino Sakuzo Award	For "American History as seen through the constitution", published by PHP Laboratories; September 16, 2004	The Yomiuri Shimbun and Chuo Koron Shinsha
2005/07/17	Yukichika Kawata (Assistant Professor, (non-tenured) Faculty of Economics; At time of screening, affiliated with Kyoto University)	2005 Agricultural Economics Society of Japan Journal Award	For paper entitled "Optimal Management of Hokkaido Sika Deer as a Regional Resource"; "Journal of Rural Economics"; Vol. 76-3; pp. 186-196; Dec. 2004	Agricultural Economics Society of Japan
2005/07/28	Tomoaki Okuda (Instructor, Faculty of Science and Technology)	The Japanese Association of Organic Geochemists Award for Young Researchers (The Taguchi Prize)	For Study on Geochemical Application of compound-specific stable carbon-isotope analysis of polycyclic aromatic hydrocarbons (PAHs)"	The Japanese Association of Organic Geochemists
2005/07/30	Kenji Kohiyama (Professor, Graduate School of Media and Governance)	21st Higashikawa Award (New Writer Award)	For "Micro presence: Insects, Microrealism"; a digital photo exhibit using insects as subjects	Higashikawa-cho, Hokkaido
2005/08/3	Jun Murai (Vice-President of Keio University; Professor, Faculty of Environmental Information)	Jonathan Postel Service Award	For efforts targeting the development and proliferation of IPv6 technologies, and for contributions to the proliferation of the Internet in the Asia-Pacific Region	Internet Society (ISOC)
2005/08/4	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology)	The Japan Society of Mechanical Engineers Design and Systems Achievement Award	For opening up new fields integrating industrial design and engineering design, and for outstanding achievements in these fields	The Japan Society of Mechanical Engineers
2005/08/27	Tomotsugu Arikawa (Instructor, (temporary commission) Faculty of Economics)	The Bryological Society of Japan Awards for Young Bryologist	For contributions to progress in bryology, through continued research in areas including the molecular phylogenetic research of pleurocarpous mosses and taxonomic study of the genus <i>Pyloisia</i>	The Bryological Society of Japan
2005/09/5	Sumiko Iwao (Professor Emeritus) Fumiko Yonezawa (Professor Emeritus)	Prime Minister's Award for Creators of a Gender Equal Society	For outstanding achievements over many years in the creation of a gender equal society	The Prime Minister of Japan
2005/09/8	Masafumi Hagiwara (Professor, Faculty of Science and Technology)	The Japan Society for Fuzzy Theory and Intelligent Informatics Contribution Award	For contributions to the Japan Society for Fuzzy Theory and Intelligent Informatics	The Japan Society for Fuzzy Theory and Intelligent Informatics
2005/09/10	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology)	The Japanese Society for the Science of Design Award	For continued research in design theory and methodologies using mathematical models	The Japanese Society for the Science of Design
2005/09/16	Ichiro Inasaki (Headmaster and Professor, Faculty of Science and Technology)	1st Precision Engineering Award	For innovative achievements in research, technology, and education in the field of Precision Engineering	The Japan Society for Precision Engineering
2005/09/20	Hideki Miyajima (Professor, Faculty of Science and Technology) . Eiji Saito (Instructor, Faculty of Science and Technology) and others	The Magnetics Society of Japan Distinguished Paper Award	For outstanding paper on "Magnetic Order in Permalloy Nano-Hexagonal Lattice" The Journal of the Magnetics Society of Japan; Vol.29 (2005) No.2 pp. 111-115	The Magnetics Society of Japan
2005/09/21	Kimihisa Yamamoto (Professor, Faculty of Science and Technology)	SPSJ Wiley Award 2005	For outstanding original research results in the field of polymer sciences, and in recognition of particularly notable research achievements	The Society of Polymer Science, Japan
2005/09/28	Ichiro Inasaki (Headmaster and Professor, Faculty of Science and Technology)	The Japan Society for Abrasive Technology Incorporation Assistance Award	For outstanding contributions to the incorporation of the Japan Society for Abrasive Technology (Special Award commemorating the 10th anniversary of incorporation)	The Japan Society for Abrasive Technology
2005/09/28	Masaaki Mitsui (Instructor, Faculty of Science and Technology)	The Molecular Structure Comprehensive Study Meeting Encouragement Award	For presentations of outstanding research results, including "Coexistence of solid-like and liquid-like states in gas phase molecular clusters	The Molecular Structure Comprehensive Study Meeting Steering Committee
2005/09/29	Mikiko Ishikawa (Professor, Faculty of Environmental Information) Research Group	Prime Minister's "Green City" Award	For Gifu Prefecture Kakamigahara City "Water and Greenery Corridor"	The Prime Minister of Japan
2005/09/30	Massato Inoue (non-tenured) Faculty of Science and Technology). Yoshiki Ujiiie (Research Associate (non-tenured), Faculty of Science and Technology) and others	Kanagawa Design Forum Award	For exhibit at Design Summit: "Proposal of new concept "ETHN-O-RIGIN" and design of information device system based on that concept"	Management Development Information Organization
2005/10/3	Jiro Kokuryo (Professor, Faculty of Environmental Information)	Internal Affairs and Communications Minister's Monthly IT Award	For playing a central role in the construction of a nationwide public network and the development of public applications	Minister of Internal Affairs and Communications
2005/10/8	Itaru Kimura (Instructor, School of Medicine)	Alcon Japan Clinical Award	In recognition of substantial contributions to progress in clinical ophthalmology, and of potential as a future leader among ophthalmologists, expected to make major contributions in the future	Alcon Research Institute
2005/10/10	Aeka Ishihara (Associate Professor, Faculty of Business and Commerce)	1st Jacob-und-Wilhelm-Grimm-Förderpreis (1st Brothers Grimm Advancement Award)	For continued research achievements related to "Goethe and Natural Science" following Ph.D. thesis	DAAD, Deutscher Akademischer Austausch Dienst (The German Academic Exchange Service)
2005/10/13	Hironao Kawashima (Professor, Faculty of Science and Technology)	2005 Economy, Trade and Industry Minister's Award for Industrial Standardization	For promoting international standardization in ISO/TC204, which deals with important standardization of Intelligent Transportation Systems (ITS), notably car navigation and Electronic Toll Collection (ETC) systems	Minister of Economy, Trade and Industry

Date Awarded (YY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2005/10/30	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology) Yoshiki Ujiiie (Research Associate(Non-tenured), Faculty of Science and Technology) and others	ICDES 2005 Best Paper Award (CAD/CAM/CAE field)	For paper entitled "Quantitative Representation Method of Complexity and its Application for Shape Generation" pp. 227-231, The 1st International Conference on Design Engineering and Science, October 2005	International Conference on Design Engineering and Science 2005
2005/10/30	Yoshiyuki Matsuoka (Professor, Faculty of Science and Technology) and others	ICDES 2005 Best Paper Award (Design Methodology field)	For presented paper entitled "Basic Study on Classification Scheme for Robust Design Methods"pp. 37-42, The International Conference on Design Engineering and Science, October 2005	International Conference on Design Engineering and Science 2005
2005/11/1	Hiroshi Kawabe (Professor, Health Center) Ikuo Saito (Professor, Health Center) Hiroataka Shibata (Assistant Professor, Health Center) Hiroshi Hirose (Assistant Professor, Health Center) Masaaki Mori (Assistant Professor, Health Center) Takanori Moriki (Assistant Professor, Health Center) Hirokazu Yokoyama (Assistant Professor, Health Center) Kaoru Fujii (Assistant Manager, Health Center) Yasuko Kuneji (Engineer, Health Center) Ayako Higo (Engineer, Health Center) Masako Takayama (Engineer, Health Center) Aya Yamagishi (Engineer, Health Center)	43rd All-Japan University Health Management Research Conference: Outstanding Presentation in General Research Division	For "Screening and bisphosphonate treatment effects using calcaneal bone ultrasound bone mass measurement"	44th All-Japan University Health Management Research Conference
2005/11/4	Atsushi Seike (Professor, Faculty of Business and Commerce), Atsuhiko Yamada (Associate Professor, Faculty of Economics)	48th Nikkei Prize for Excellent Books in Economic Science	For the book "The Economics of Older Workers" (in Japanese) Nihon Keizai Shimbun, Inc., October 2004	Nihon Keizai Shimbun, Inc. / Japan Center for Economic Research
2005/11/4	Koji Nomura (Associate Professor, Institute for Economic and Industrial Studies)	48th Nikkei Prize for Excellent Books in Economic Science	For the book "Measurement of Capital and Productivity in Japan" Keio University Press, October 2004	Nihon Keizai Shimbun, Inc./ Japan Center for Economic Research
2005/11/8	Kouhei Ohnishi (Professor, Faculty of Science and Technology)	IEEE IECON 2005 Best Paper Award	For paper entitled "Real-Time Gait Planning for Pushing Motion of Humanoid Robot"	Institute of Electrical and Electronics Engineers
2005/11/18	Shuzo Murakami (Professor, Faculty of Science and Technology)	A Foreign member of the Korean Academy of Science and Technology	For outstanding research achievements in Earth, City, and Construction Environment Engineering, and for making substantial contributions to the promotion of science and technology in Korea; including a keynote speech at an International Conference hosted by the Korean Academy of Science and Technology (KAST)	The Korean Academy of Science and Technology (KAST)
2005/11/21	Masao Nakagawa (Professor, Faculty of Science and Technology)	IEEE Fellow	For contributions to the development of CDMA (Code Division Multiple Access) and mobile communication technologies	Institute of Electrical and Electronics Engineers
2005/11/25	Takao Takahashi (Professor, School of Medicine) Kenjiro Kosaki (Associate Professor, School of Medicine) Hiroyuki Shimada (Instructor, School of Medicine) Takayuki Mitsuhashi (Research Associate (non-tenured), School of Medicine)	2005 Japan Universities Association for Computer Education Award	In recognition of outstanding contributions to the future of medical education; specifically, for the development and application of a patient database that manages in-depth clinical information while protecting personal information, and for efforts to use this database for clinical clerkship where students can learn effectively and independently about the thinking processes of physicians in the field.	Japan Universities Association for Computer Education
2005/11/28	Yoko Sazanami (Professor Emeritus)	French Order of Arts and Letters; <i>Officier</i>	For research related to direct investments and trade in Europe from Japan and other parts of Asia	The Republic of France
2005/12	Shuzo Murakami (Professor, Faculty of Science and Technology)	CIB PC COMMENDATION 2005	For contributing to the success of SB05 Tokyo (The 2005 World Sustainable Building Conference in Tokyo), held jointly by CIB, iSBE, and UNEP, and for outstanding contributions to CIB	International Council for Research and Innovation in Building and Construction
2005/12/1	Haruyuki Minamitani (Professor, Faculty of Science and Technology) Ichiro Tanaka (Assistant Professor, School of Medicine) and others	Forum Facial Studies 2005: 10th Japanese Academy of Facial Studies Conference, Best Presentation Award	For developing a "Facial Expression Movement and Facial Nerve Paralysis Analysis and Diagnostic System," and for a research paper that enabled quantification of various types of facial expression movement and quantitative diagnosis of Facial Nerve Paralysis.	Japanese Academy of Facial Studies "Forum Facial Studies 2005"
2005/12/5	Masayuki Amagai (Professor, School of Medicine)	C.E.R.I.E.S. Research Award 2005	In recognition of an outstanding research project that clarifies the mechanism of skin peripheral immune tolerance for maintaining healthy skin	C.E.R.I.E.S. (Centre de Recherches et d'Investigations Epidermiques et Sensorielles) (Epidermal and Sensor Research and Investigation Center)
2005/12/14	Toshiki Nishiyama (Assistant Professor (Non-tenured), Graduate School of Media and Governance)	Eco Design 2005 Best Poster Award	For research in methods of achieving ecological universal design through the use of high-performance wheelchairs	EcoDesign Promotion Network
2006/2/20	Tetsuya Komagata (Associate Professor, Faculty of Economics)	2005 Small and Medium-sized Business Research Encouragement Award	For the book "Case Studies on Chinese Small and Medium-sized Enterprises in the Transitional Period" (in Japanese) Zeimukeiri Kyokai Co. Ltd., July 5, 2005	Shoko Research Institute
2006/3/1	Makoto Ida (Professor, Law School)	Siebold Award 2006	In recognition of commitment to better mutual understanding of culture and society in Germany and Japan	Alexander von Humboldt Foundation Japan
2006/3/9	Masayuki Amagai (Professor, School of Medicine)	Japan Society for Promotion of Science (JSPS) Award	For outstanding research achievements in both fundamental and clinical investigation on an autoimmune skin blistering disease, pemphigus; specifically, for identifying the target autoantigen in pemphigus and for the development of a novel strategy for autoimmune model mouse.	Japan Society for the Promotion of Science
2006/3/19	Tomotsugu Arikawa (Instructor (Temporary Commission), Faculty of Economics)	The Presentation Award on the Annual Meeting of the Japanese Society for Plant Systematics	For the presentation entitled "Phylogenetic analysis of Takakiophyta using multiple chloroplast-encoded genes" on the poster session of the 5th Annual Meeting of the Japanese Society for Plant Systematics	Japanese Society for Plant Systematics
2006/3/28	Masaaki Mitsui (Instructor, Faculty of Science and Technology)	The Chemical Society of Japan (CSJ) Award for Young Chemists	For outstanding achievements in the "Development of formation method of giant molecular clusters and elucidation of their electronic structures"	The Chemical Society of Japan

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# Access Information

## Mita Campus

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

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



## Hiyoshi Campus

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

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



## Yagami Campus

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

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



## Shinanomachi Campus

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

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



## Shonan Fujisawa Campus

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

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



## Shin-Kawasaki Town Campus

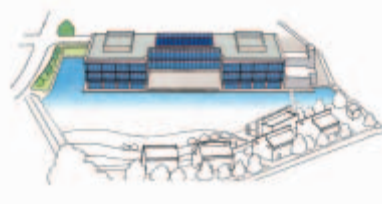
144-8 Ogura, Saiwai-ku, Kawasaki-shi, Kanagawa 212-0054  
TEL +81-44-580-1580

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



## Tsuruoka Town Campus Center Building

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

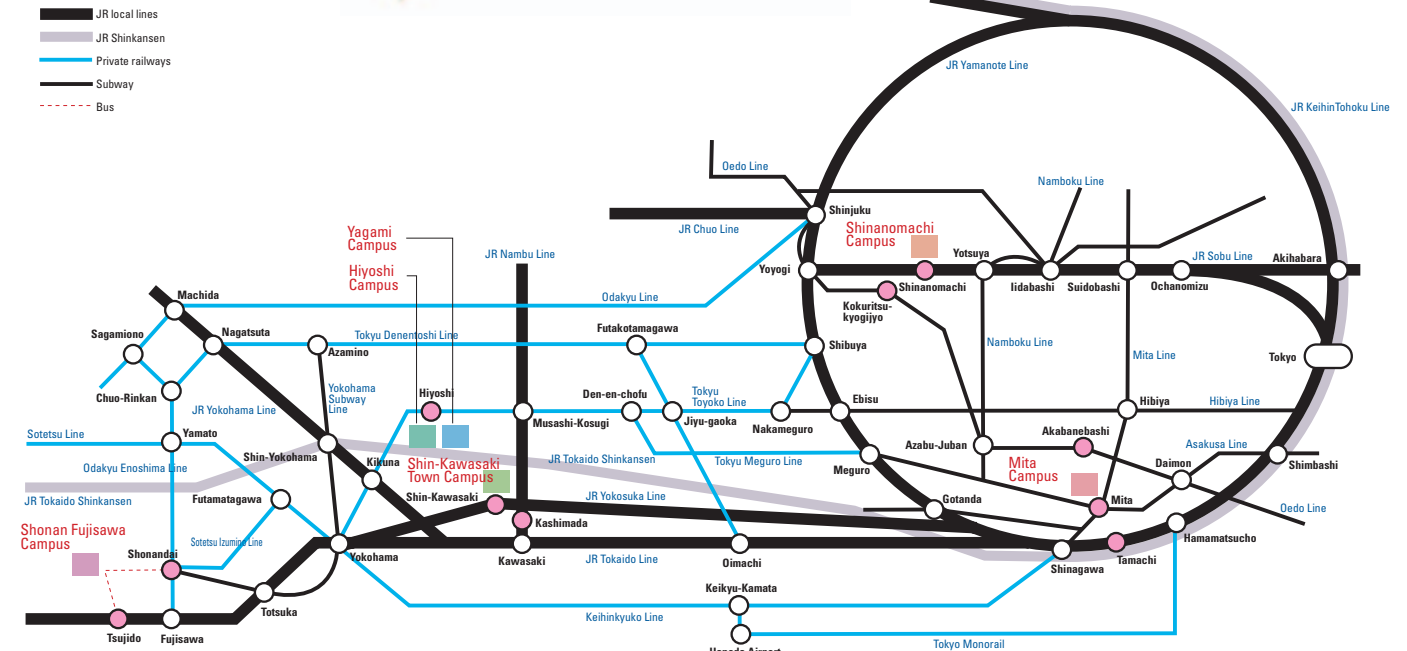
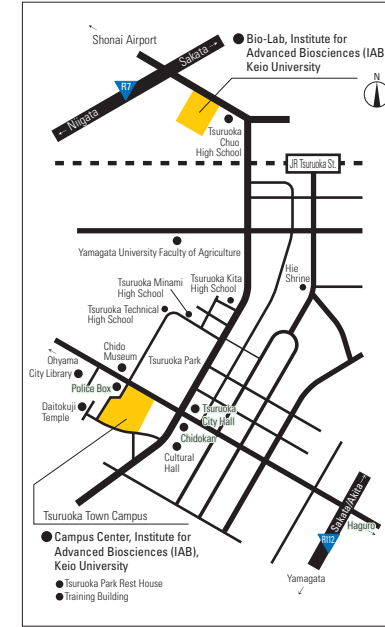


## Bio-lab

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



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



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