



Keio University Annual Report on Research Activities

2003 2004

Toward the Creation of Intellectual Values
— Formation of Research Centers and Infrastructure for Collaboration
between Industry, Government and Academia —



Keio University Annual Report on Research Activities

2003 ▶ 2004

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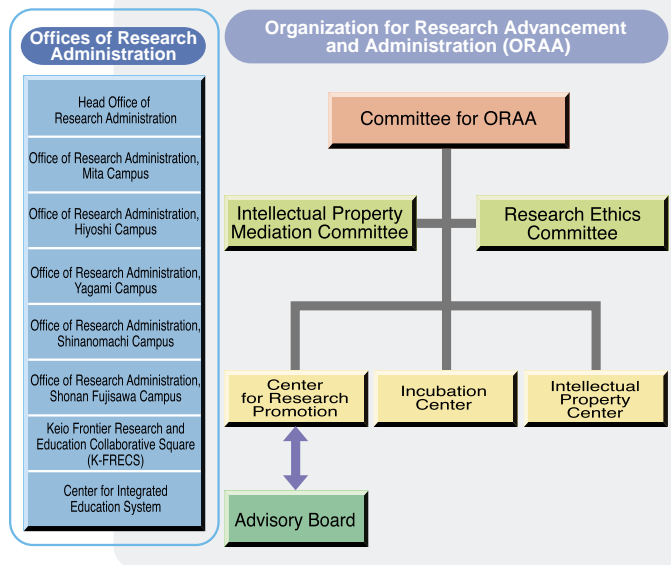
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Organization for Research Advancement and Administration (ORAA)

Organization for Research Advancement and Administration (ORAA)

Students, Teaching Staff, Administrators, Researchers
Faculties, Graduate Schools, Research Institutes, Collaborative Square,
Affiliated Schools



Promotion of Research Activities at Keio University

Along with its traditional interests in education and research, Keio University believes that its most important mission is to return the fruits from both endeavors to society. Based on "*Gakujutsu Sendo (leadership for scientific progress)*," Keio aims at promoting internationally competitive and creative scientific research in order to make significant contributions to the 21st Century, thus serving as driving force for future society.

A large number of advanced and joint research projects are routinely underway at each Keio campus: Mita, Hiyoshi, Yagami, Shinanomachi and Shonan Fujisawa. In FY2002 and FY2003, a total of 12 proposals by Keio University were designated for the *21st Century Centers of Excellence (COE) Program* by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Each project is actively being pursued. In FY2004, Keio's proposal was once again approved, this time as the first private university to be designated a "Super-COE," a *Project for Creating a Strategic Research Center*. This is an award constituting one of the largest competitive funds available some 800 million yen per year allocated by the Ministry.

Research projects at Keio often involve collaboration between industry, government and academia. Such research activities are most distinctively being practiced at the Keio Leading-edge Laboratory of Science and Technology (KLL), the Center for Integrated Medical Research, the Shin-Kawasaki Keio Frontier Research and Education Collaborative Square, the Institute for Advanced Biosciences, and the Keio Research Institute at SFC.

The Offices for Research Administration on each campus have long played an important institutional role. These Offices provide practical advice and services to support individual researchers. Keio has successfully and, proactively, sought to protect and properly utilize research results as identifiable intellectual properties since the 1998 establishment of the Intellectual Property Center (IPC). The IPC is pioneering technology licensing organization in Japan. On October 1, 2003, Keio also launched the Organization for Research Advancement and Administration (ORAA) to further facilitate a series of research activities by supporting researchers, generating new and innovative research, and promoting research returns to society.

Roles and Functions of the Organization for Research Advancement and Administration (ORAA)

The ORAA is composed of the Center for Research Promotion, the Incubation Center, the Intellectual Property Center (IPC), and the Offices of Research Administration, as illustrated in the figure. It makes overall strategy of the University, for cooperation with industry, government and academia, and for supporting a system of researchers and research projects within the University, from the start of planning to the end of returning the results to society. The major roles and functions of each organization in the ORAA are as follows.

The Center for Research Promotion is the contact point, for anyone outside Keio University in private business, research institutions, or a university, in- and outside Japan, interested in Keio-related research collaboration. The Center functions as a representative of the University, and organizes comprehensive agreements between corporations and all of Keio, including the planning for commercialization of technologies and matching coordination with the best possible combination of research and researchers.

This does not mean to totally cast off existing "one section of a company to one laboratory of university" type cooperation, but rather to derive greater benefits from cross-sectional, industry-government-academia exchange of technologies, research and development projects, by taking advantage of competencies within Keio University, due to its variety of disciplines.

In the University, the Center surveys governmental policy and industrial trends, collects and analyzes information on research grants and subsidies, provides information to researchers, and to the **Advisory Board**. The Board, in turn, formulates comprehensive and strategic research topics for Keio. It also cooperates with other offices in the ORAA, such as Offices of Research Administration, and the IPC.

The Incubation Center is an organization dedicated to supporting and nurturing business efforts at the initial stage, as these originate from researchers, administrative staff, and students of Keio University.

*As of November 2004, the Incubation Center has not yet commenced operations. Please direct any enquiries to the Center for Research Promotion.

The Intellectual Property Center (IPC) is a technology licensing organization with a range of responsibilities. IPC is responsible for the management and operation of intellectual properties to the support of a venture started within the

University. Upon request of an inventor, the IPC closely examines the patentability or potential for licensing, files an application for a patent, and manages its maintenance.

Another important role of the IPC is to support licensing and venture startups. The Center also hosts the Keio Technology Licensing Forum to introduce potential startups from Keio to local businesses. The Center also manages investment possibilities in a venture company from the Entrepreneur Assistance Fund.

The Offices of Research Administration located on each campus at Mita, Hiyoshi, Yagami, Shinanomachi and Shonan Fujisawa, provide official information on sources of research, facilities, opportunities for research grants to researchers, and a variety of services including support for making or negotiating for joint or commissioned researches, management of research expenses, operation of laboratories, and compilation and presentation of research results. The offices also function, standing by the researchers, as a contact point for collaboration on campus and cooperate with each organization within the ORAA.

Furthermore, the Head Office of Research Administration functions as an umbrella to integrate an Office of Research Administration on each campus, the Center for Keio Frontier Research and Education Collaborative Square (K-FRECS), and the Center for Integrated Education System. The Head Office, on one hand, shares and compiles information on researches and researchers with other offices and develops and maintains a research database. It is, on the other hand, responsible for supporting transmission of research results from Keio, for instance, as in the "Symposium for Interim Report on Keio University 21st Century COE Programs" held on April 17 and April 19, 2004.

Inventors at Keio University may lodge objections for patent applications with the Intellectual Property Mediation Committee. The Research Ethics Committee deals with and keeps every party well informed of rules and regulations concerning not only intellectual properties but also research ethics, conflicts of interest and duties, and issues on side jobs and confidentiality.

Guide to Research at Keio University

The Center for Research Promotion is a one-stop contact point for enquiries from local governments, private enterprises, universities, and research institutions, regarding anyone interested in research collaboration with Keio University. Any request or question entered in the form provided on a website at <http://www.crp.keio.ac.jp/> or e-mail message to crp@keio.ac.jp will be replied to in a prompt manner, or forwarded to more suitable offices for response.

The Intellectual Property Center will provide consultation for licensing, venture startups, intellectual properties, or technology transfers, at <http://www.ipc.keio.ac.jp/>. If interested in research at the Graduate School of Science and Technology on Yagami Campus, the Liaison Office of Keio Leading-edge Laboratory of Science and Technology (KLL) give advice to enquiries at <http://www.kll.keio.ac.jp/>. Please also refer to the "Access Information" at the end of this booklet (p.p. 17-18).

The 21st Century COE Program

Since its foundation in 1858, Keio University has been at the forefront of education and research in Japan. For 146 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 creating the future of Japan and the global community.

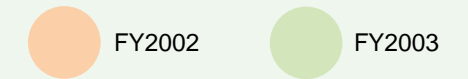
The University's application to participate in *the 21st Century COE Program* for FY2002 and FY2003 is an opportunity to advance its fundamental mission through two main focuses: neutrality and a firm

commitment to society. *The 21st Century COE Program* opens up new possibilities to focus upon the creation of significant intellectual values and human resource development, while remaining impartial and unaffected by the short-term trends of society. Keio University will reinforce its commitment to society by actively contributing to discussions of current social issues.

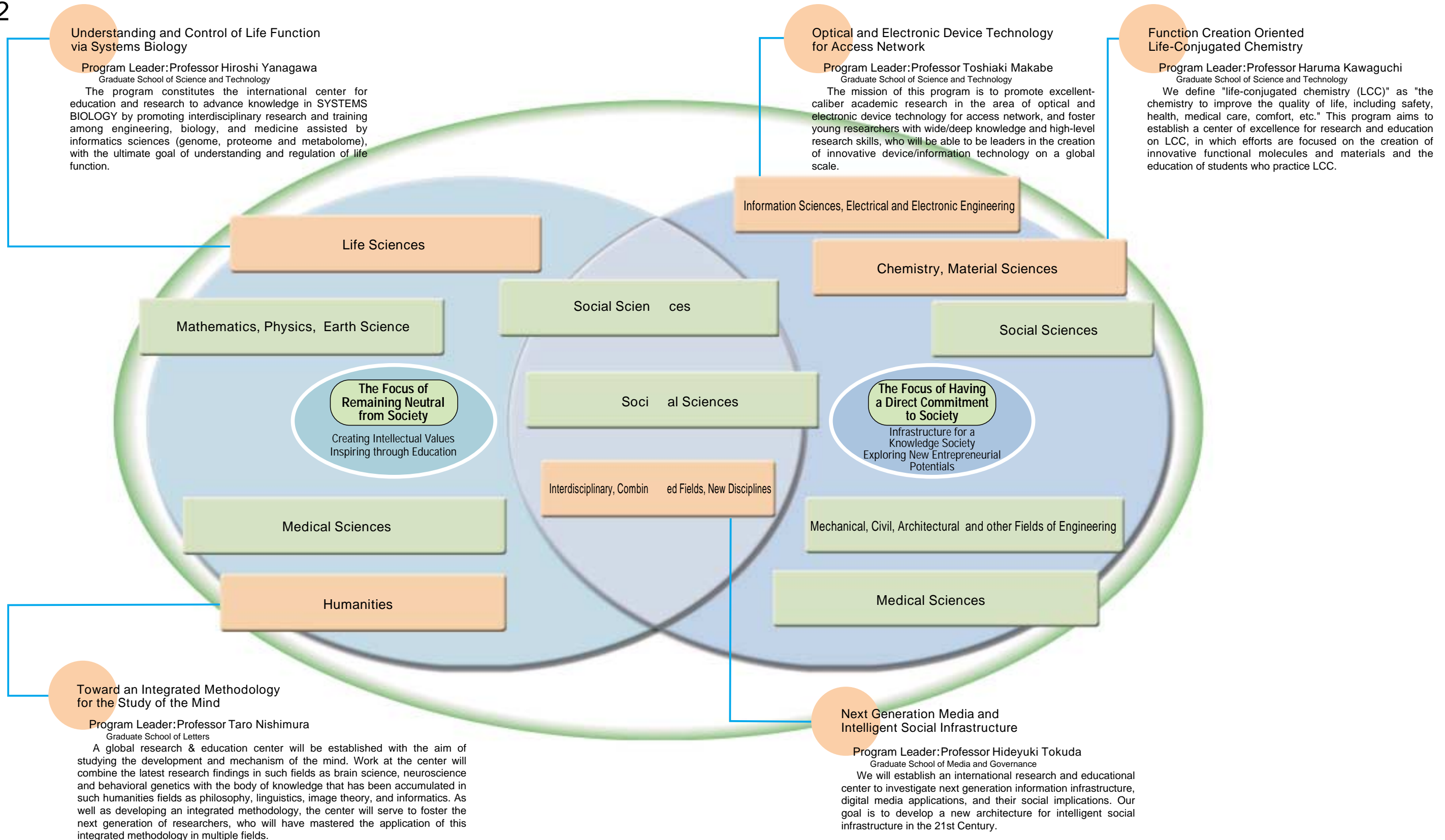
Keio University aims to become a leader in the global society of the 21st Century through the creation of dynamic development and integration of these two focus points at an international level, based upon a unique elliptical model.

* Please refer to the Japan Society for the Promotion of Science website for more information about *the 21st Century COE Program*: <http://www.jsps.go.jp/j-21coe/>

* 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



FY2002



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

Program Leader: Professor Yoshiaki Kobayashi
Graduate School of Law

With the globalization that has been progressing in recent years, clashes in the area of multiculturalism have made themselves apparent in many states and societies. On the consideration that these problems cannot be resolved at the level of political leadership alone, the program proposed will establish mechanisms to clarify the ways citizens' attitudes is promoted, developed and changed, and to consider the direction in which multicultural communities are moving.

The eventual aim is to establish a "multicultural citizen's attitudes research center" and to establish an enlarged "citizens' attitudes data archive," targeted at a variety of countries. Together they will constitute Japan's first internationally-oriented human research network. Research plans: to increase data and related analyses regarding citizens' attitudes in a multicultural world; establishing the causes of conflicts, while carrying on investigation into conditions that will make it harder for such conflicts to arise. Research will be undertaken into the outlook for political society in the twenty-first century: the differences in attitudes of

political society within multiculturalism in particular comparison between the generation responsible for contemporary society and the generation who will bear that responsibility in the future. Education-related plans: providing research funds for younger researchers on a competitive basis, as well as organizing graduate students to participate in surveys relating to the main area of proposed research, giving instruction on the implementation of citizens' attitudes surveys and related analyses. Moreover, in order to make known the results of research undertaken in foreign languages, along with the publication of a foreign language review, it is proposed to subsidize travel expenses for those presenting at international conferences.

Through these research and educational approaches, we aim to establish a program of global research and education, not only carrying out opinion surveys into citizens' attitudes, but effecting research and education of the highest international standard into the topic of global civil governance.

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

Program Leader: Professor Naoyuki Yoshino
Graduate School of Economics

Since the early 1990s, the Japanese economy has been in a long recession. Our 21st century center of excellence program is premised on the belief that the fundamental cause of this long lasting recession is the lack of high quality markets within the Japanese economy. We believe that improving the quality of Japanese markets is the key to revitalizing the economy. Motivated by this belief, our program aims to reveal the determinants of market quality by combining theoretical and empirical analyses with a broad range of historical and institutional case studies.

On the one hand, the importance of "quality" has been emphasized in various facets of managerial sciences. On the other hand, issues related to quality have not been fully examined in economics, perhaps due to difficulties associated with quantifying a "quality." In particular, market quality has never been presented as a subject for serious economic analysis. Gathering leading economists and managerial scientists at Keio University, our program intends to shed light on this new research subject and hopes to develop a new school of thought guiding economic policymaking.

In order to conduct sound quantitative analyses of market quality, high quality data is indispensable. In order to build such data, in our program, we design and build longitudinal panel data; longitudinal panel data tracks, for a large number of economic agents, activities of each agent over a long span of time. Unfortunately in Japan, unlike in the U.S. and Europe, the accumulation of longitudinal data, in particular on consumption, remains poor. We are determined to make continuous and long lasting efforts to become a leading center of longitudinal panel data in Japan.

Data that we can confirm to be reliable will be made usable for public. We are certain that these data will greatly contribute not only to understanding market quality but also to research in various fields of social science beyond our research theme.

Policy Innovation Initiative

Program Leader: Professor Moriyuki Oe
Graduate School of Media and Governance

The purpose of this program is to establish a network of research and training organizations in Japan and Asia. This network will enable researchers and practitioners to cooperate in finding the "problems" in need of solutions, in identifying and developing the resources to be mobilized for the solutions, and in generating consensus in the methods of solving the problems. We also aim at realigning existing methods of inquiry in a manner conducive to finding and solving the "problems" attendant upon the rapidly increasing pressures of globalization, demographic change, and environmental change. Our purpose is to develop a new mode of analysis and practice for effective policy formation and to form a new policy innovation "community" where scientific and practical knowledge can be joined.

As enunciated in the 1994 Human Development Report of the UNDP, "freedom from fear and freedom from want" represent the essence of human security. We join in this formation of policy imperatives. The specific issues requiring innovative policies for promoting "human security" are diverse. Common to all these issues are the threats and the unmistakable condition of insecurity each poses to the individuals, to the communities, and to the regions involved, regardless of their stages of economic development.

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

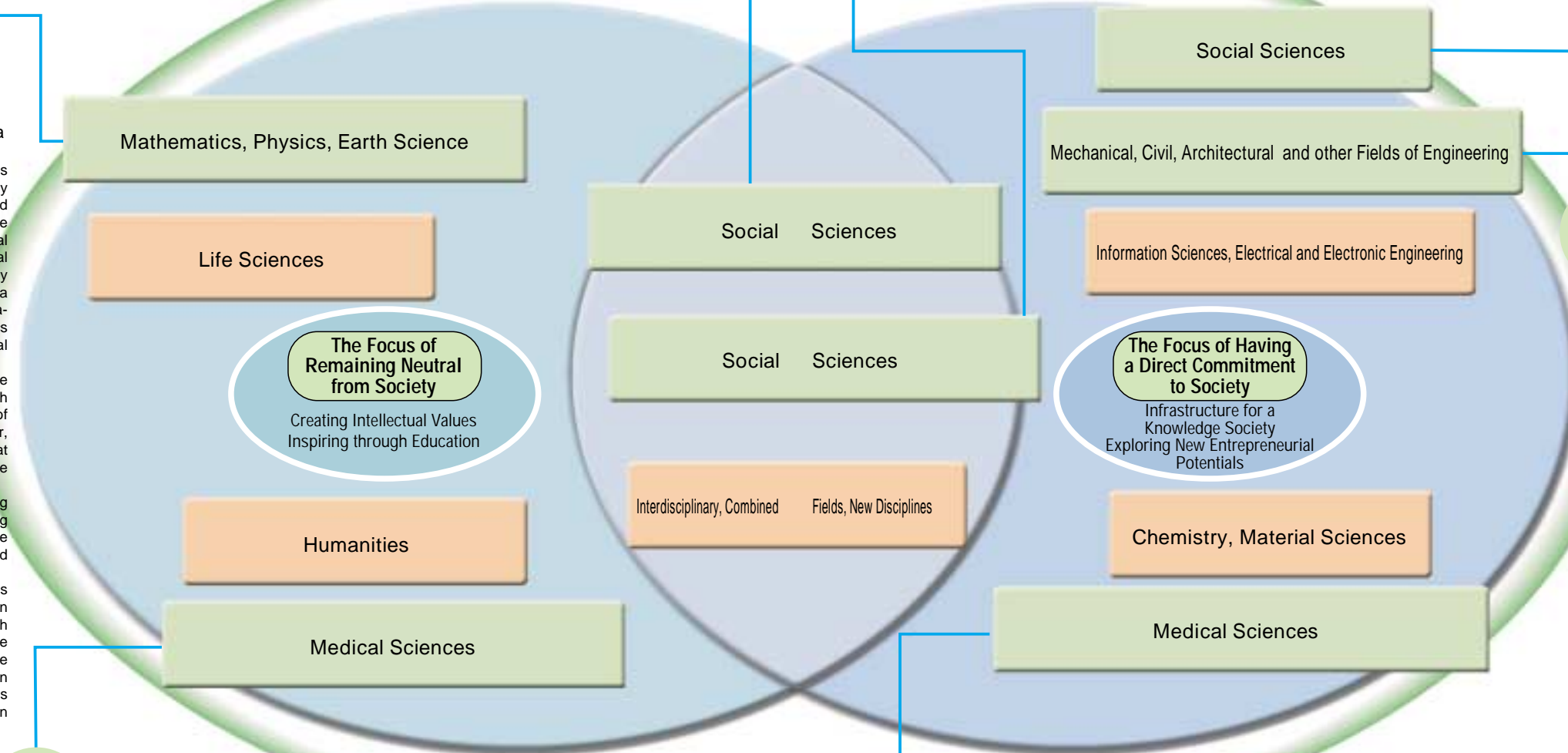
Program Leader: Professor Yoshiaki Maeda
Graduate School of Science and Technology

The Integrative Mathematical Sciences program is designed to open up new horizons in mathematics by bridging the gaps between pure mathematics and application-oriented mathematics, and to investigate new concepts and leadership methods for mathematical sciences. The core of the research and educational program is built on pure mathematics, as supported by data science and experimental mathematics. Data science serves as the interface to various data-intensive phenomena, and experimental mathematics supports the experimental aspect of mathematical sciences.

The main objective of our program is to promote the construction of international educational and research centers through integrating these three aspects of mathematical sciences. To facilitate our efforts further, the Center for Integrative Mathematical Sciences at Keio will be established under the auspices of the President at the earliest possible opportunity.

As well as our research projects, we have a strong mandate to encourage Ph.D. students and young researchers internationally. For this purpose, we have already started weekly interdisciplinary seminars and colloquia to enhance interdisciplinary exchanges.

Another important aspect of our COE programs is domestic and international collaborations in mathematical sciences with educational and research institutions overseas. We also invite researchers to give lecture series for graduate students, both to inform the students of progress in recent important problems in mathematics, and to encourage research collaborations with the COE program. We also plan to organize an international workshop each year.



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

Program Leader: Professor Hideyuki Okano
Graduate School of Medicine

The Keio University Graduate School of Medicine boasts an excellent staff in two academic fields: (1) stem cell biology and regenerative medicine, and (2) immunology and autoimmune disease research using animal models of human diseases. The COE takes maximum advantage of the traditional joint research system approaches based on the development of experimental animal models since the founding of the school, and while ensuring ethicality and safety based on the achievements of basic medicine, the basic and clinical staffs collaborate in endeavoring to elucidate the pathophysiology of incurable diseases and to develop new treatment methods. It will form a "self-renewing" educational center that will foster and turn out many researchers with a broad perspective. The COE will be characterized by I) incorporation of basic biology, taking advantage of *Drosophila* genetics, into the medical area, II) development of *in vivo* experimental medicine using human cells and original animal models of human disease, and III) application of the results by the university hospital that possesses state-of-the-art clinical capabilities. It will also establish an evaluation system that will enable the maintenance of high-level studies by introducing research projects at the Research Park.

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

In this COE program, we will attempt to establish individualized cancer therapies based on the comprehensive development of minimally invasive and innovative therapeutic methods through translational research. Research will be conducted in three main areas: 1) development of diagnostic methods enabling individualized treatment, including genetic diagnosis and new RI imaging; 2) development of minimally invasive treatments, including endoscopic and robotic surgery; and 3) development of new cancer treatments, including immunotherapy, gene therapy and molecular target therapy. This research will be mainly performed at the Keio University Center for Integrated Medical Research, which has several new research facilities like the Laboratory Animals Center, RI Center and Central Research Laboratory, as well as at Keio University Hospital. To conduct this program efficiently, strong collaboration

between the basic and clinical departments of the Keio University Graduate School of Medicine and the Graduate School of Science and Technology as well as between Keio University and outside academia and industry will be required. The center's Shinanomachi Research Park will provide research space for collaborations. Updated cancer research information on basic and clinical topics will be made available to graduate students, young researchers and medical doctors to enhance their research capabilities. International symposia and worldwide teleconferences will help to provide a global perspective on learning. Through these efforts, we will attempt to establish a world renowned cancer center that can quickly translate basic research into clinical applications while training the next generation of researchers and medical doctors needed for the future advancement of cancer medicine.

- FY2002
- FY2003

Technology Transfer

The Intellectual Property Center (IPC) was established in November 1998 as a Technology Licensing Organization (TLO) based on a policy that research results originating from Keio University are valuable intellectual assets for which the University actively promotes implementation, protection and utilization of these rights. The IPC as a right holder would work even harder for its mission and strengthen ties and cooperation between the University and society, corresponding to the "Jitsugaku no Seishin, (spirit of practical learning)" as Yukichi Fukuzawa, as the University's founder advocated.

Flow of Technology Transfer



Patent Applications

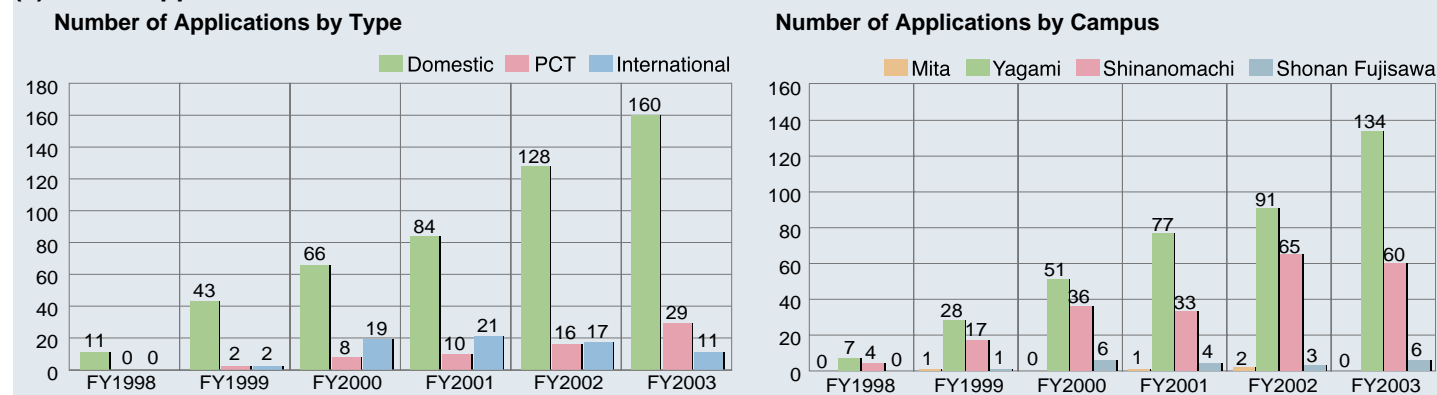
Types of intellectual assets are diverse including inventions, programs and creations, but can generally be categorized into two types, the "patent type" and the "non-patent type." The Intellectual Property Center supports licensing of both types, but has given high priority to the intellectual property for the "patent type" for which the acquisition of rights is necessary for licensing. A total of over 627 patent applications have been filed (492 in Japan, 135 overseas) since the center's establishment. The School of Medicine and the Faculty of Science and Technology have been particularly active in patent application in the fields of bio and medical technologies, with bio/medical making up 50 percent of the total, information/communication/electronics and

control/measurement each making up 20 percent, and materials/chemicals making up 10 percent.

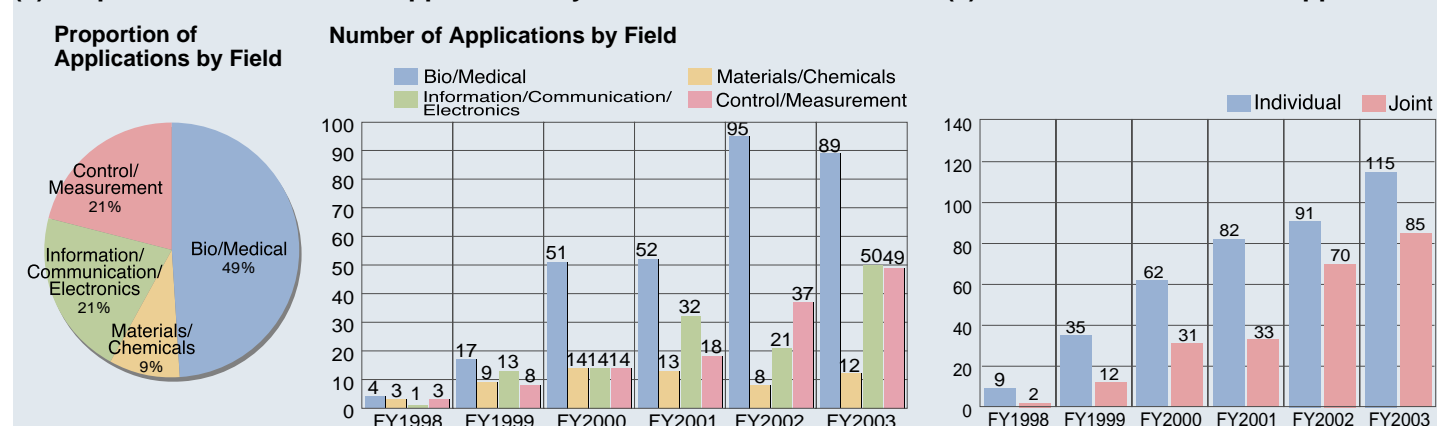
One of the characteristics of FY2003 was the increase in joint patent applications with foundations and private enterprises. Joint applications only made up 20 to 40 percent in the past, but this figure jumped up to 58 percent in FY2003, indicating that research at the Faculty of Science and Technology in collaboration of KLL (Keio Leading-edge Laboratory of Science and Technology) and Shinanomachi Research Park in the School of Medicine have begun to bear fruit.

34 patents had been obtained as the university continues to apply for evaluation of licensed items as of FY2003.

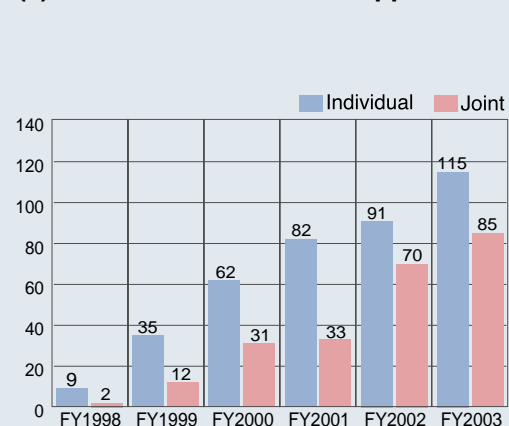
(1) Patent Applications



(2) Proportion and Number of Applications by Field



(3) Number of Joint Patent Applications

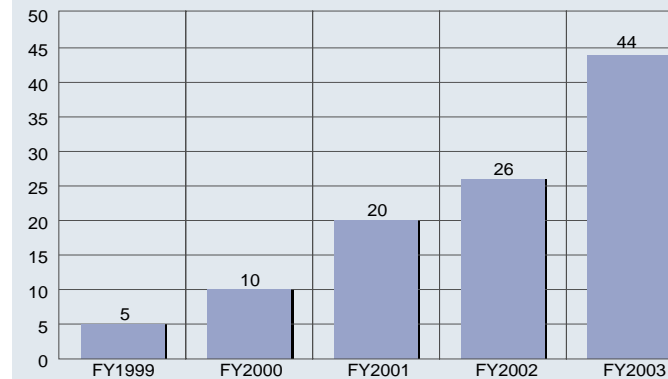


Licensing

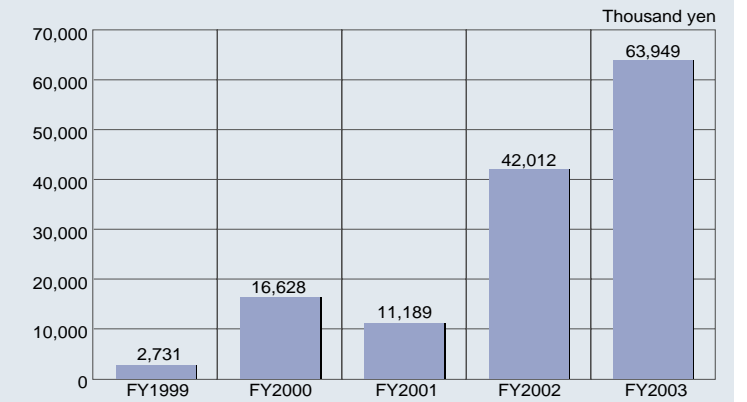
A total of 105 cases of patent licensing have been made since the Intellectual Property Center was founded. Most of the companies that entered into these contracts were of a

small or medium sized. Licensing revenues have increased as so did the number of cases, reaching 64 million yen in FY2003 for a cumulative total of 137 million yen.

Number of Licensing



Licensing Revenues



Initiatives by Intellectual Property Center

1. Nurture of Venture Business

The Intellectual Property Center (IPC) is responsible for the initiatives described below in support of starting a venture company as an effective means of commercializing technologies born from Keio University, as well as creating good environment for ventures by finding and training resource persons through these initiatives.

1) Keio Venture Forum

Keio Venture Forum has been organized to provide support and advice on business planning to start a venture company originating from Keio's industrial property right. The forum offers services to venture capitalists, trading companies and incubators, which have cooperative agreements with Keio.

2) Entrepreneur Assistance Fund

Keio University has established an Entrepreneur Assistance Fund to invest up to one million yen but less than 30 percent of the total capital in a research and development-based venture company originating from industrial property rights of Keio University. The Operating Committee for the fund makes a final decision on each investment upon recommendation by the IPC.

3) Licensing to Venture Companies

Keio University accepts licensing fees through equity such as stock or stock options in lieu of cash, following a careful consideration of the financing standing of the venture company.

2. Promotion of Technology Licensing

Learning from the last five-year experience of technology transfer, the IPC believes that small and medium-sized enterprises are the most important potential partners. From that point of view, the IPC has newly organized a Keio Technology Licensing Forum to strengthen collaboration with smaller businesses outside Tokyo. The Forum promotes nationwide networking by introducing Keio's technologies to local businesses. It also aims to foster two-way collaboration not only by introducing the University's potential, but also by going out to find local needs. The Forum was held in

Nagoya and Kawasaki in FY2003, and plans to come to Kyushu and other areas in FY2004.

3. Promotion of Commercialization

The IPC promotes technology transfer, by helping develop software or making a prototype to demonstrate the advantages of the patented technology which seems to be theoretically and conceptually convincing but rather difficult to evaluate commercial values otherwise.

4. Coordination of Joint Research

The IPC actively coordinates joint research with private enterprises utilizing the intellectual property rights of Keio University. The IPC's promotion of venture businesses born from Keio also contributed to procurement of governmental funds, including the "Project to Create Businesses Originating from Universities and Research and Development of Application of University Technology" by the Ministry of Economy, Trade and Industry, and the "Project to Support the Creation of Ventures Originating from Universities" by the MEXT. Such external funds from private enterprises and the government amounted to 502 million yen in FY2003.

The IPC gives advice on terms and conditions of a joint research contract, which needs to be carefully phrased, especially for intellectual property rights, taking both positions of the University and the business into consideration.

Venture Companies Assisted by Keio University

- SNT Co.
- GBS Research Co., Ltd.
- V-cube Inc.
- Human Metabolome Technologies, Inc.
- Oxygenix Inc.
- Lattice Technology
- Eco-s Corporation
- Signal Creation Co. Ltd.
- Propgene Co. Ltd.

Comparison of Universities by Competitive Research Funds Distributed

The competitive research fund is defined here as "a fund for research and development to be distributed to researchers and institutions making proposals to 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 field of subject."* One example should be "the 21st Century COE Program" for which Keio University won twelve projects in total in FY2002 and FY2003. As is typically so a fund for the "Project for Creating Strategic Research Center" of Special Coordination Funds for Promoting Science and Technology by the MEXT, commonly known as "Super COE," for which Keio was adopted in May 2004 (cf. p.1).

The national budget for competitive research funds in FY2003 totaled to approximately 350 billion yen, equivalent to 10% of investment in government research and development. Out of it, approximately 135 billion yen was allocated as *Grants-in-Aid for Scientific Research*, known as *Kakenhi* designated by the MEXT (also see the website of the Japan Society for the Promotion of Science). In terms of amount, Kakenhi should be the most typical of competitive research funds of all.

The table and graph below show the top twenty research institutions *Kakenhi* distributed, according to the number of (new and continuing) projects adopted and changes in amount from FY2001 to FY2003. The amount of the University of Tokyo, the top institution, accounts for approximately 10% of the total. The *Kakenhi* amount distributed to Keio University is ranked the first among the private universities, but the number of projects adopted equals only some 20% of that of the University of Tokyo, and 10% for the amount distributed.

*Kagaku Gijutsu Sozo Rikkoku no tameno Kyosoteki Kenkyu Shikin no Seido Kaikaku (Reform of Competitive Research Funding System for Japan as a Nation based on Creativity of Science and Technology)," Cabinet Office, April 30, 2004.

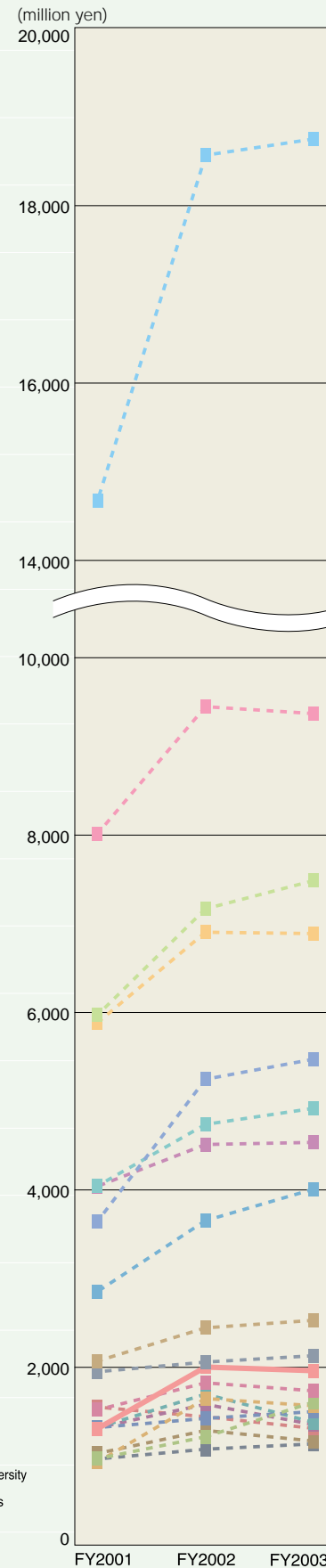
Distribution of MEXT Grants-in-Aid for Scientific Research (Kakenhi) by Institution, FY2001-FY2003 (total amount of new and continuing projects)

Rank	FY2001		FY2002		FY2003	
	Research Institution	Number of Projects	Amount (million yen)	Research Institution	Number of Projects	Amount (million yen)
1	The University of Tokyo	2,574	14,675	The University of Tokyo	2,610	18,568
2	Kyoto University	1,863	8,012	Kyoto University	1,881	9,448
3	Osaka University	1,517	5,970	Osaka University	1,531	7,169
4	Tohoku University	1,541	5,882	Tohoku University	1,571	6,905
5	Hokkaido University	1,185	4,043	Nagoya University	1,045	5,248
6	Kyushu University	1,243	4,040	Hokkaido University	1,138	4,738
7	Nagoya University	983	3,643	Kyushu University	1,271	4,511
8	Tokyo Institute of Technology	685	2,852	Tokyo Institute of Technology	722	3,654
9	University of Tsukuba	658	2,070	University of Tsukuba	684	2,445
10	Hiroshima University	781	1,950	Hiroshima University	789	2,058
11	National Institute of Genetics	64	1,551	Keio University	543	2,003
12	Kobe University	544	1,521	Kobe University	562	1,825
13	Okayama University	530	1,321	Chiba University	453	1,698
14	Chiba University	431	1,320	Okazaki National Research Institutes	194	1,648
15	Tokyo Medical and Dental University	364	1,319	Tokyo Medical and Dental University	383	1,583
16	Keio University	512	1,306	National Institute of Genetics	64	1,443
17	Kumamoto University	348	1,028	Okayama University	553	1,423
18	Niigata University	410	1,001	Kumamoto University	354	1,288
19	RIKEN	301	969	RIKEN	323	1,217
20	Kanazawa University	377	967	Niigata University	418	1,089

Classified by research institution to which the representative of the research project is affiliated.



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



The two tables and graph below show the top twenty research institutions by overall amount of competitive research funds distributed in FY2001 and FY2002. The vast majority was distributed to national universities, particularly to seven former imperial universities (before becoming national universities in 1947), (Hokkaido University, Tohoku University, the University of Tokyo, Nagoya University, Kyoto University, Osaka University, and Kyushu University). That accounts for nearly 40% of the total and the University of Tokyo alone received more than 10% of the total.

The 19 institutions out of the 20 appeared both in FY2001 and FY2002. Keio University was ranked eleventh for both years (the first among private universities).

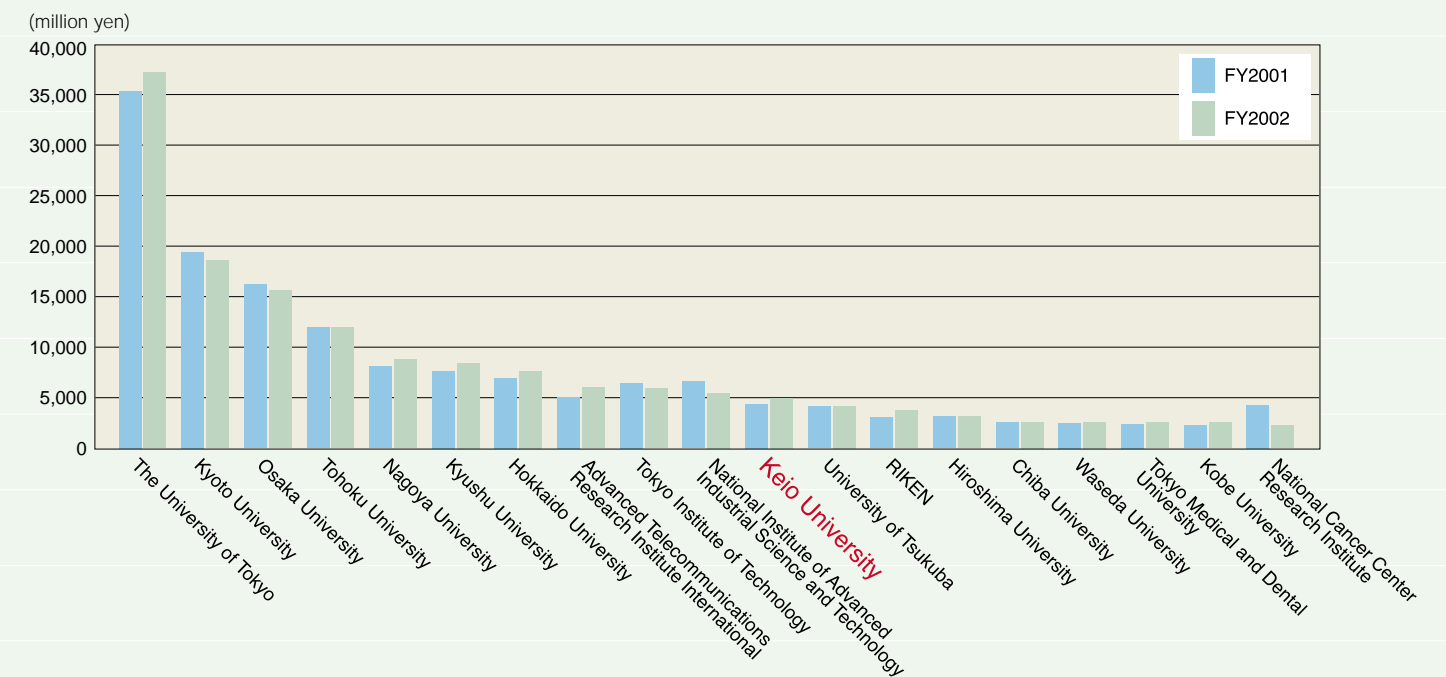
Top Twenty Research Institutions by Total Distribution of Competitive Research Funds

FY2001			FY2002		
Rank	Institution	(million yen)	Rank	Institution	(million yen)
1	The University of Tokyo	35,334	1	The University of Tokyo	37,177
2	Kyoto University	19,405	2	Kyoto University	18,601
3	Osaka University	16,193	3	Osaka University	15,591
4	Tohoku University	11,934	4	Tohoku University	11,924
5	Nagoya University	8,111	5	Nagoya University	8,784
6	Kyushu University	7,635	6	Kyushu University	8,420
7	Hokkaido University	6,933	7	Hokkaido University	7,640
8	National Institute of Advanced Industrial Science and Technology	6,589	8	Advanced Telecommunications Research Institute International	6,008
9	Tokyo Institute of Technology	6,458	9	Tokyo Institute of Technology	5,924
10	Advanced Telecommunications Research Institute International	5,050	10	National Institute of Advanced Industrial Science and Technology	5,478
11	Keio University	4,357	11	Keio University	4,978
12	National Cancer Center Research Institute	4,292	12	University of Tsukuba	4,169
13	University of Tsukuba	4,152	13	RIKEN	3,724
14	Hiroshima University	3,167	14	Hiroshima University	3,138
15	RIKEN	3,037	15	Chiba University	2,586
16	Chiba University	2,564	16	Waseda University	2,586
17	Waseda University	2,492	17	Tokyo Medical and Dental University	2,544
18	Tokyo Medical and Dental University	2,393	18	Kobe University	2,517
19	National Institute of Genetics	2,331	19	National Institute of Health Sciences	2,267
20	Kobe University	2,225	20	National Cancer Center Research Institute	2,148

Indirect expenses included.

Source: "Kagakugijutsu Sozo Rikkoku no tameno Kyosoteki Kenkyu Shikin no Seido Kaikaku - Seifu kenkyu kaihatsu database ni motozuku jittai bunseki to kaikaku sekkei (Reform of the Competitive Research Funding System to Establish Japan as a Nation based on Creativity of Science and Technology - an Analysis of the Situation and Reform Design based on the Government Research and Development Database)," Cabinet Office, April 30, 2004.

"Science News," March 12, 2004, <http://www.sci-news.co.jp/news/200403/160312.htm>

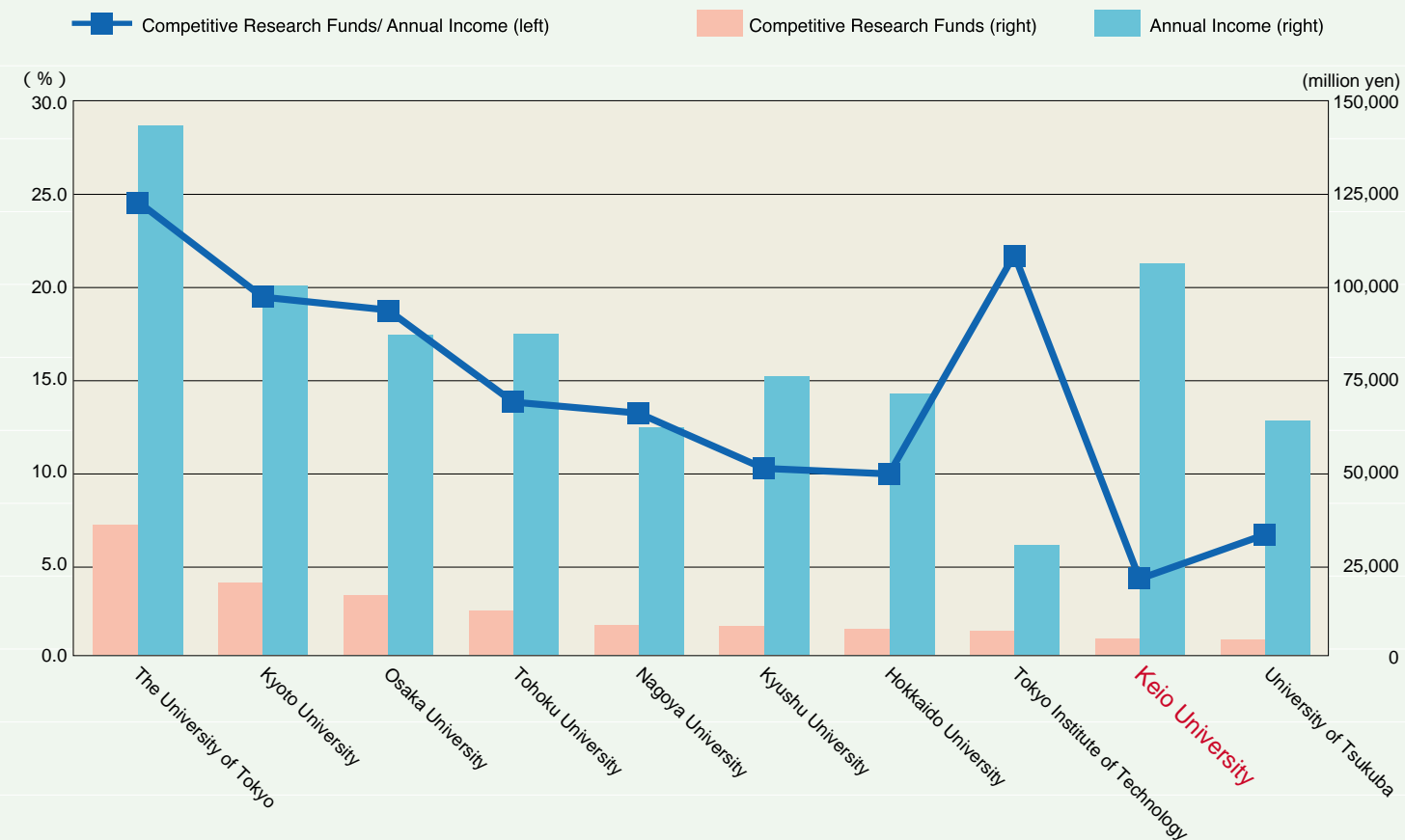


The graph below compares the top nine universities with Keio University according to the ratio of competitive research funds to university's revenues in FY2001.

Three major sources of revenue (106 billion yen) of Keio University are tuition, including other student fees and entrance examination fees, income from medical activities, and subsidies from government. Tuitions and medical income (83 billion yen) together account for 78% of the total, and the subsidies (17 billion yen) for 16%, according to "Keio Gijukuho (Keio Newsletter)," No. 2009, June 10, 2002. Competitive research funds to Keio remain at the level of approximately 4% of the revenue, as seen in the graph.

At national universities, to the contrary, subsidies from government account for approximately 70% of the revenues while tuitions for only some 10% ("Shukan Toyokeizai (Weekly Toyokeizai)," October 19, 2002). This is because the government fully covered deficiencies of revenues of national universities until their becoming independent university corporations in April 2004. The supplementary subsidies enabled revenues of national universities to maintain the same or higher than Keio's, despite lower income from tuition and medical fees. It should be remarked that, in addition to the subsidies, competitive research funds equivalent to 10-25% of the revenues are still allocated to national universities.

Ratio of Competitive Research Funds to Annual Income



Note 1: Indirect expenses are included in competitive research funds.

Note 2: Annual Income = Total Income - Transferred to Capital Fund

Total income includes tuition fees, entrance examination fees and other fees, donations, subsidies, income from asset management, business and medical activities, and miscellaneous sources.

Note 3: Competitive research funds are NOT included in total income.

Source: "Kagakujijutu Sozo Rikkoku no tameno Kyosoteki Kenkyu Shikin no Seido Kaikaku - Seifu kenkyu kaihatsu database ni motozuku jittai bunseki to kaikaku sekkei (Reform of the Competitive Research Funding System to Establish Japan as a Nation based on Creativity of Science and Technology - an Analysis of the Situation and Reform Design based on the Government Research and Development Database)," Cabinet Office, April 30, 2004, and "Shukan Toyokeizai (Weekly Toyokeizai)," October 19, 2002.

Incomes of national universities are quoted from "Shukan Toyokeizai (Weekly Toyokeizai)." Statement of account of the national universities has been adjusted to its equivalent of private universities.

Research Funds at Keio University in FY2003

Research funds at Keio University from national and local government institutions, private businesses, university funding, etc., totaled to approximately 14.9 billion yen in FY2003, 1.1 billion yen increase from 13.8 billion yen in FY2002. One of the factors appears to be a large increase in subsidies, especially a total of 985 million yen for newly adopted seven programs for the 21st Century COE Program.*

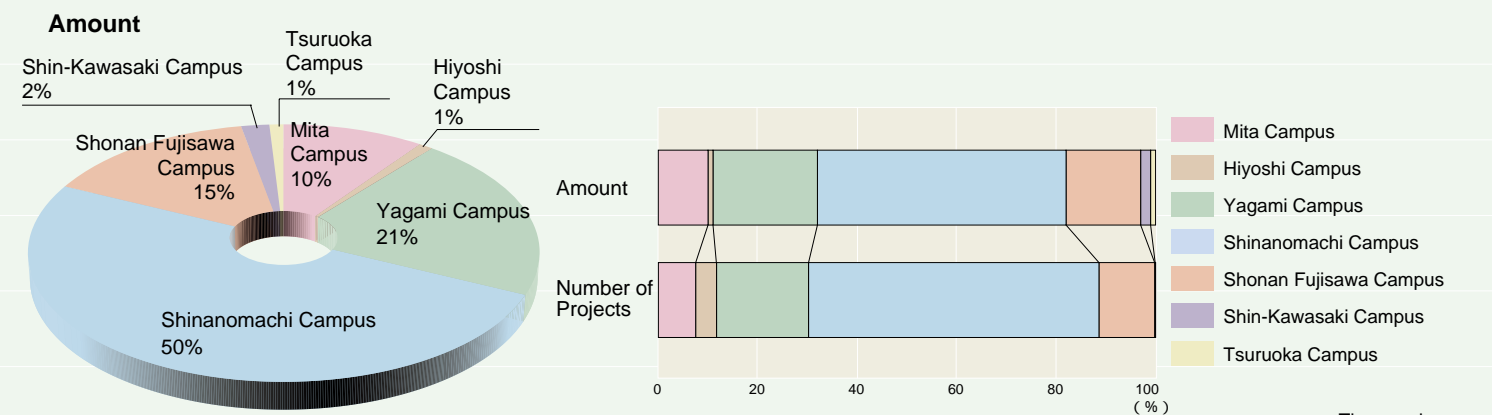
In the following, data on research funds are categorized by 1. campus, 2. affiliation of researchers, 3. type of funds, and 4. field of research.

*Method of categorization used here is different from that in "Keio University Annual Report on Research Activities 2002-2003."

1. Research Funds by Campus

The data in this section show total of research funds by campus. Some of funds of research projects are compiled for a campus where the projects are not actually conducted.

From the largest to smallest in number of research projects, Shinanomachi Campus is on the top, followed by Yagami, Shonan Fujisawa, Mita, Hiyoshi, Shin-Kawasaki, and Tsuruoka. Shinanomachi collects more than a half of amount of total research funds.



Campus	Number of Projects	Amount (Thousand yen)
Mita Campus	227	1,476,480
Hiyoshi Campus	126	170,454
Yagami Campus	557	3,180,370
Shinanomachi Campus	1,762	7,379,498
Shonan Fujisawa Campus	339	2,291,409
Shin-Kawasaki Campus	3	260,715
Tsuruoka Campus	3	206,000
Total	3,017	14,964,926

2. Research Funds by Affiliation of Researchers

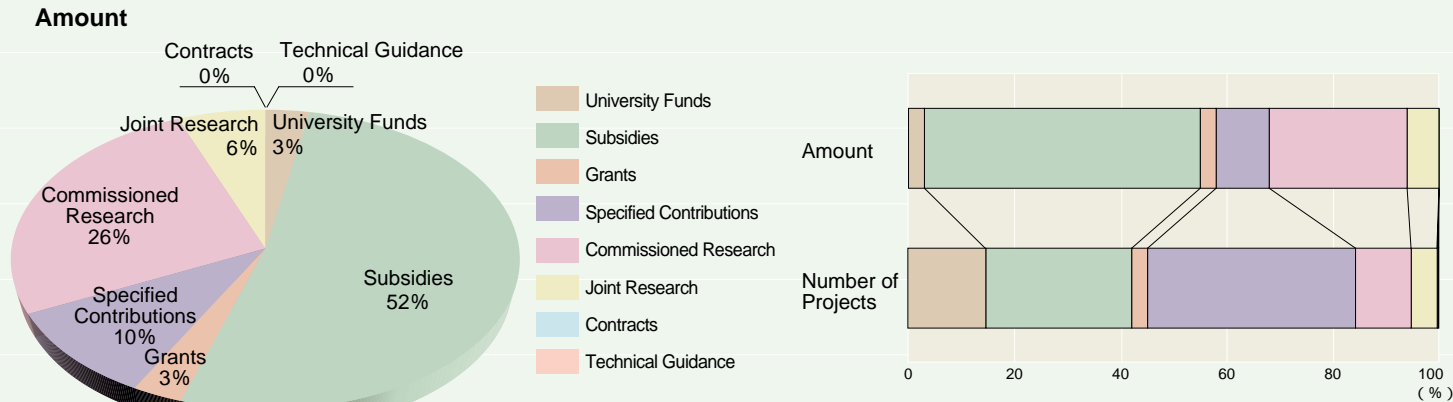
Researchers are affiliated to undergraduate faculties, graduate schools, or research institutions across the campuses. The table on the right shows number of research projects and amount of funds allocated by affiliation of researchers.

In both the number of research projects and the amount of funds, the School of Medicine/ Graduate School of Medicine come on top of the list, followed by the Faculty of Science and Technology/ Graduate School of Science and Technology, and the Faculty of Environmental Information, accordingly.

Affiliation of Project Leader	Number of Projects	Amount (Thousand yen)
Faculty of Letters / Graduate School of Letters	102	399,815
Faculty of Economics / Graduate School of Economics	74	499,832
Faculty of Law / Graduate School of Law	47	173,600
Faculty of Business and Commerce / Graduate School of Business and Commerce	55	187,708
School of Medicine / Graduate School of Medicine	1,742	6,747,592
Faculty of Science and Technology / Graduate School of Science and Technology	557	3,177,970
Faculty of Policy Management	52	423,099
Faculty of Environmental Information	218	2,766,476
Faculty of Nursing and Medical Care	39	78,860
Graduate School of Human Relations	2	2,000
Graduate School of Business Administration	13	28,004
Graduate School of Media and Governance	45	287,590
Research Institutes	57	78,420
Other	14	113,960
Total	3,017	14,964,926

3. Research Funds by Type

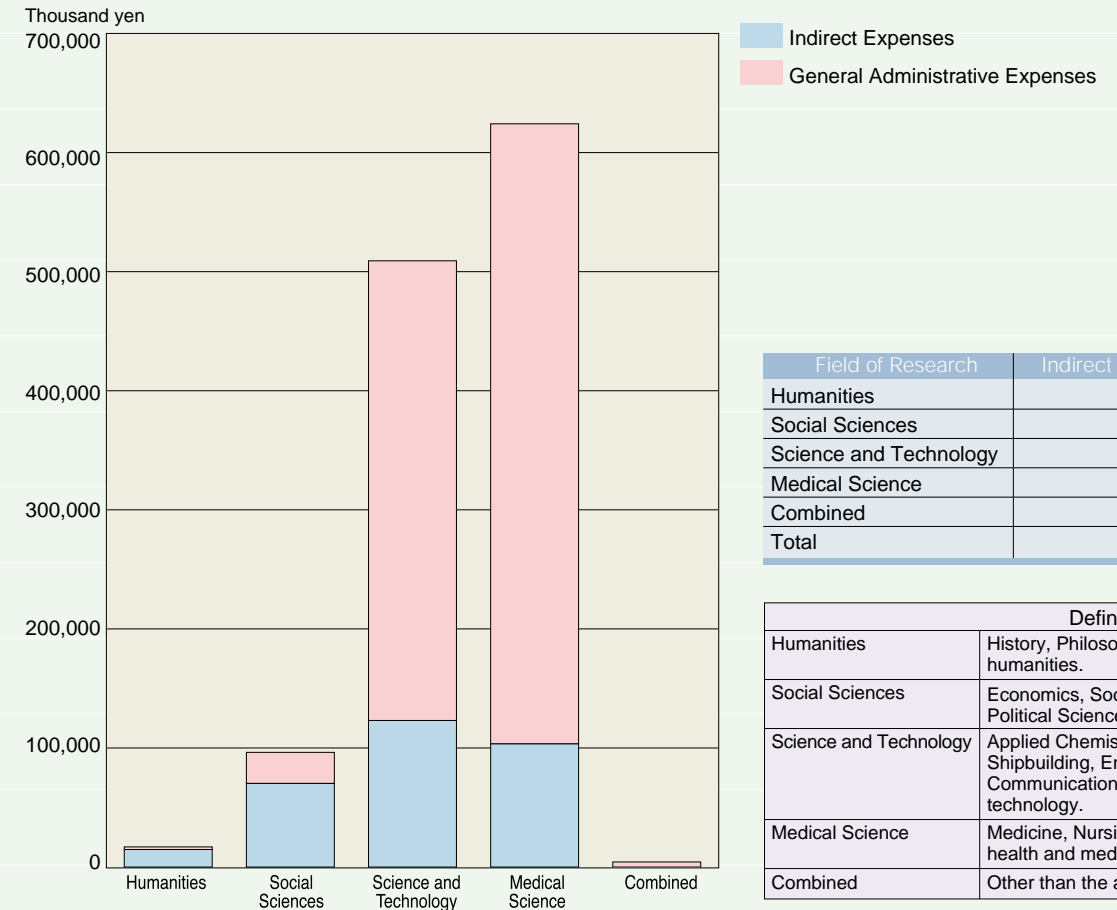
The number of projects funded by specified contributions results in the largest of all, compared with the other types of funding. In terms of amount, funds from subsidies come first, followed by commissioned research. These two types of funds account for approximately 80% of the total research funds.



Type of Funds	Number of Projects	Amount (Thousand yen)
University Funds	445	431,879
Subsidies	829	7,827,573
Grants	92	424,996
Specified Contributions	1,183	1,429,650
Commissioned Research	313	3,904,056
Joint Research	149	873,517
Contracts	4	67,225
Technical Guidance	2	6,030
Total	3,017	14,964,926

Definition	
Subsidies	Research funds provided mainly by government and other 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, other public offices and private enterprises.
Joint Research	Collaborative research through personnel exchanges and/or sharing technology and/or facilities under the joint research agreement with /without payment of research funds.
Contracts	Research under a contract agreement.
Technical Guidance	Research involving technical guidance such as development of equipment or apparatus.

Indirect Expenses and General Administrative Expenses



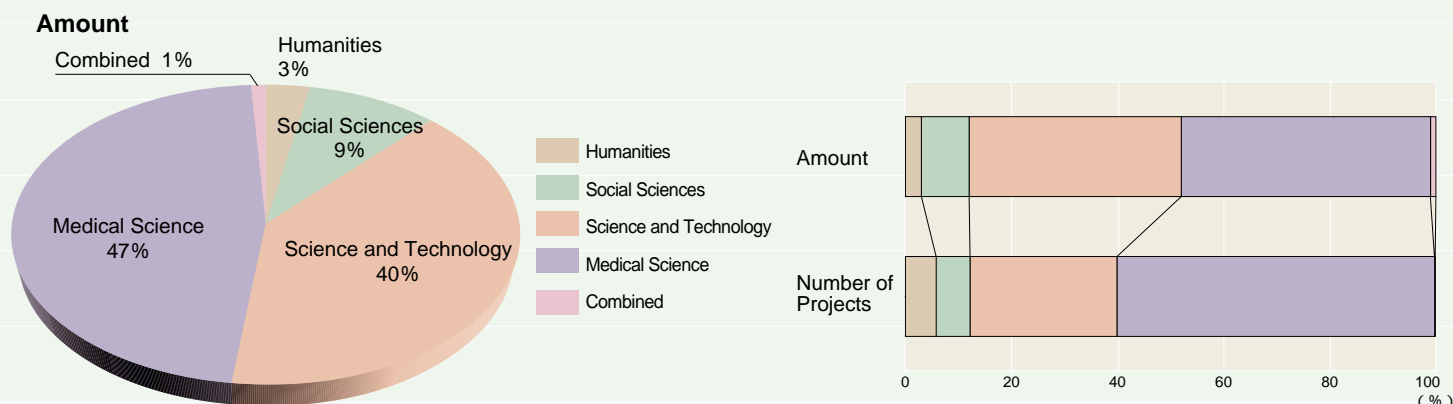
Field of Research	Indirect Expenses (Thousand yen)	General Administrative Expenses (Thousand yen)
Humanities	14,715	1,539
Social Sciences	70,237	26,077
Science and Technology	123,095	386,024
Medical Science	103,415	520,763
Combined	0	2,195
Total	311,462	936,598

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 and Communications, Physics, and other science and technology.
Medical Science	Medicine, Nursing, Pharmaceutical Science, and other health and medical sciences.
Combined	Other than the above.

4. 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. In both number of research projects and amount funded, the field of medical science comes first, and science and technology second, together making approximately 90% of the total research funds.

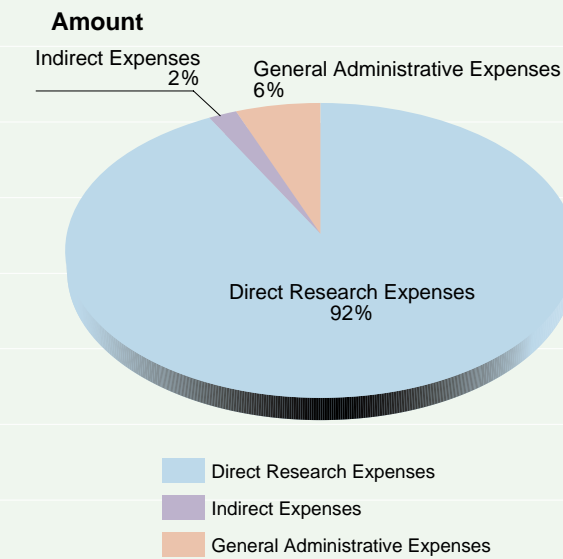
Both fields are also ranked first and second respectively, in the allocations for general administrative and indirect expenses.



Field of Research	Number of Projects	Amount (Thousand yen)
Humanities	176	509,169
Social Sciences	196	1,374,838
Science and Technology	837	6,055,142
Medical Science	1,806	6,861,162
Combined	2	164,615
Total	3,017	14,964,926

5. Ratio of Direct Research Expenses to Research Funds

Direct research expenses account for over 90% of the total research funds, while general administrative expenses and indirect expenses account for the rest.



Total (Thousand yen)		
Direct Research Expenses	13,716,866	
Indirect Expenses	311,462	
General Administrative Expenses		936,598
Total	14,964,926	

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

Researchers at Keio University in FY2003

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 University researchers (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 16% overall, but is a striking 45% at Shonan Fujisawa Campus.

Campus	Tenured Researchers	Researchers with Fixed Period Contract	Special Research Professors	Total
Mita	341	23	7	371
Hiyoshi	294	19	0	313
Yagami	245	14	44	303
Shinanomachi	492	4	79	575
Shonan Fujisawa	126	47	57	230
Total	1,498	107	187	1,792

As of May 1, 2003

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	Number of Doctorates Awarded
Graduate School of Letters	5
Graduate School of Economics	1
Graduate School of Law	2
Graduate School of Human Relations	3
Graduate School of Business and Commerce	6
Graduate School of Medicine	38
Graduate School of Science and Technology	56
Graduate School of Business Administration	3
Graduate School of Media and Governance	14
Dissertation Doctorate	
Graduate School of Letters	2
Graduate School of Economics	1
Graduate School of Law	2
Graduate School of Human Relations	3
Graduate School of Business and Commerce	2
Graduate School of Medicine	72
Graduate School of Science and Technology	21
Graduate School of Business Administration	0
Graduate School of Media and Governance	7

As of March 31, 2004

Number of Students Registered in Doctoral Courses

Number of Students Registered in Doctoral Courses	Maximum Entrants	Number of Students Registered
Graduate School of Letters	< 45 >	116
Graduate School of Economics	< 15 >	80
Graduate School of Law	< 30 >	113
Graduate School of Human Relations	< 11 >	44
Graduate School of Business and Commerce	< 20 >	56
Graduate School of Medicine *1	< 68 >	154
Graduate School of Science and Technology	< 150 >	323
Graduate School of Business Administration	< 8 >	13
Graduate School of Media and Governance	< 30 >	159

As of May 1, 2003

The figure in brackets indicates maximum entrants for the graduate school.

*1 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 a good environment for intellectual exchange and synergistic cooperation with researchers both within and outside the institution, with the goal of sharing common or related research subject.

On Mita and Hiyoshi campuses, each research institution has its own system to accept researchers from outside. On the Shinanomachi Campus, the Integrated Medical Research Center can accept researchers, as can the Keio Leading-edge Laboratory of Science and Technology (KLL) at Yagami, and the Keio Research Institute at Shonan Fujisawa.

Number of Researchers Accepted - Breakdown by Campus

Campus	Status	Number of Researchers	Qualifications
Mita	Refer to Table A	343	
Hiyoshi	Refer to Table B	90	
Yagami	Research Associates of Faculty of Science and Technology	78	Participating in research without a contract of commissioned research.
	Researchers of Keio Leading-edge Laboratory of Science and Technology (KLL)	36	Participating in research under the contract of commissioned research.
Shinanomachi	School of Medicine Researcher	204	Researchers employed by research, educational, or medical institutions other than the Graduate School of Medicine at Keio University.
Shonan Fujisawa	Research Fellow, Keio Research Institute at SFC*1	193	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 master's degree or qualified as equivalent having experience and achievements as an independent researcher.
	Assistant Research Fellow, Keio Research Institute at SFC*2	128	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.
Total		1,072	

Table A. Research Institutes on Mita Campus

Research Institute	No. of Researchers at Keio University *3	No. of Researchers not employed by Keio	Total
Institute of Cultural and Linguistic Studies	57	54	111
Institute for Media and Communications Research	7	56	63
Institute for Economic and Industrial Studies (Sangyo Kenkyujo)	37	33	70
Institute of Oriental Classics (Shido Bunko)	7	0	7
International Center	45	19	64
Teacher Training Center	44	37	81
Fukuzawa Memorial Center for Modern Japanese Studies	23	37	60
Institute of East Asian Studies	21	31	52
Center for Japanese Studies	12	32	44
Research Center for the Arts and Arts Administration	23	16	39
Global Security Research Center *4	44	28	72
Total	320	343	663

Table B. Research Institutes on Hiyoshi Campus

Research Institute	No. of Researchers at Keio University *3	No. of Researchers not employed by Keio	Total
Institute of Physical Education	19	43	62
Health Center	22	2	24
Keio Research Center for Foreign Language Education	24	1	25
Sports Medicine Research Center	10	5	15
Keio Research Center for the Liberal Arts	165	39	204
Total	240	90	330

Figures show the totals for FY2003.

*1 Current Senior Visiting Researchers, Keio Research Institute at SFC.

*2 Current Visiting Researchers, Keio Research Institute at SFC.

*3 Researchers at Keio University: the figure indicates total number of researchers including teachers in the affiliated elementary and secondary schools of Keio University, in addition to tenured and non-tenured researchers of undergraduate faculties, graduate schools or research institutes.

*4 Current Global Security Research Institute (G-SEC).

Access Information

Mita Campus

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

8 minutes 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 minutes walk from Mita St. (Asakusa or Mita Line)
8 minutes 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 Kikuna-Hiyoshi.



Shin-Kawasaki 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 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 Nanbu Line);
Approximately 7 minutes by train from Kawasaki to Kashimada



Tsuruoka 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 18 minutes by car from Shonai Airport to Tsuruoka Campus
By train: approximately 120 minutes by Joetsu Shinkansen (bullet train) from Tokyo St. to Niigata St., then approximately 100 minutes by Uetsu Honsen (main line) from Niigata St. to Tsuruoka St., then 5 minutes by car.

Yagami Campus

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

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 Kikuna-Hiyoshi.
Approximately 10 minute by car from Shin-Kawasaki St. (JR Yokosuka Line);
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
5 minutes walk from Kokuritsu-kyogijo St. (Oedo Line)



Shonan Fujisawa Campus

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

10 minutes by bus from Shonandai St. (Odakyu Enoshima Line, Sagami Tetsudo Izumino Line, or Yokohama Subway Line);
Approximately 40 minutes by train from Yokohama to Shonandai.
25 minutes by bus from Tsujido St. (JR Tokaido Line);
Approximately 30 minutes by train from Yokohama to Tsujido.



Contact Information

Mita Campus

CRP: Center for Research Promotion
crp@keio.ac.jp
IPC: Intellectual Property Center
toiawasesaki-ipc@adst.keio.ac.jp
Head Office of Research Administration
ora-honbu@adst.keio.ac.jp
Office of Research Administration, Mita Campus
shien-mita@adst.keio.ac.jp
ORAA: Office for Research Advancement and Administration
oraa@keio.ac.jp
Hiyoshi Campus
Office of Research Administration, Hiyoshi Campus
ras-hiyoshi@adst.keio.ac.jp

Yagami Campus

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ras-shinanomachi@adst.keio.ac.jp
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kri-sfc@sfc.keio.ac.jp
Shin-Kawasaki Campus
k2-tc2@adst.keio.ac.jp
Tsuruoka Campus
office@ttck.keio.ac.jp

Campus	Faculty / Graduate School	Research Institutes
Mita Campus	Faculty of Letters Faculty of Economics Faculty of Law Faculty of Business and Commerce Graduate School of Letters Graduate School of Economics Graduate School of Law Graduate School of Human Relations Graduate School of Business and Commerce Law School	Institute of Cultural and Linguistic Studies Institute for Media and Communications Research Institute for Economic and Industrial Studies (Sangyo Kenkyujo) Institute of Oriental Classics (Shido Bunko) International Center Teacher Training Center Fukuzawa Memorial Center for Modern Japanese Studies Institute of East Asian Studies Center for Japanese Studies Research Center for the Arts and Arts Administration Global Security Research Institute (G-SEC)
Hiyoshi Campus	Faculty of Letters Faculty of Economics Faculty of Law Faculty of Business and Commerce School of Medicine Faculty of Science and Technology Graduate School of Business Administration	Institute of Physical Education Health Center Keio Research Center for Foreign Language Education Sports Medicine Research Center Keio Research Center for the Liberal Arts
Yagami Campus	Faculty of Science and Technology Graduate School of Science and Technology	Keio Leading-edge Laboratory of Science and Technology
Shinanomachi Campus	School of Medicine Faculty of Nursing and Medical Care Graduate School of Medicine	Center for Integrated Medical Research
Shonan Fujisawa Campus	Faculty of Policy Management Faculty of Environmental Information Faculty of Nursing and Medical Care Graduate School of Media and Governance	Keio Research Institute at SFC
Shin-Kawasaki Campus	—	Keio Frontier Research and Education Collaborative Square
Tsuruoka Campus	—	Institute for Advanced Biosciences

