

Annual Report on Research Activities

2013-2014

Preface

Vice chancellor of the Ritsumeikan Trust, Ritsumeikan University Vice-President

Kozo WATANABE



The mission of universities, as stipulated in Japanese law, is to conduct educational and research activities with a focus on academics, share those results with society at large, and contribute to the development of society. Research is especially subject to high expectations to give the knowledge and results gained through research activities back to the educational field, as well as give research results back to society at large.

In 1994, Ritsumeikan moved the College of Science and Engineering to the Biwako-Kusatsu Campus (henceforth, BKC) and took advantage of the opportunity to promote industry-academia-government collaboration. Thus, by giving back the University's Knowledge and Skills, Ritsumeikan contributed to society, improved its quality as a university, and promoted the advancement of education and research.

As a result of these efforts, we have been able to increase our external research funds from corporate, governmental, and other groups. Especially from the point of view of the strengthening of basic research, the number of projects chosen for Grants-in-Aid for Scientific Research is largely increasing. Furthermore, in AY 2013, under the "Center of Innovation Program (COI STREAM)" sponsored by the Ministry of Education, Culture, Sports, Science and Technology-Japan, two research bases were selected as the COI trial base. At the same time, we believe it is necessary to continue to energetically engage in the undertakings of fostering young researchers and female researchers that will be leading the next generation, as well as the internationalization of research. Concerning the ethical issues surrounding researchers that have been receiving much attention in recent days, we will comply with the rules and push forward in creating a research university that is open to the society as stipulated in the guideline of research ethics of Japan.

In AY 2015, the Osaka-Ibaraki Campus will be opened and it is poised to be the platform of new research activities. Among the three concepts of "Gateway of Asia," "Urban Co-creation," and "Regional and Social Collaboration" at Osaka-Ibaraki Campus, Ritsumeikan Global Asia Research Organization as well as Ritsumeikan Asia Japan Research Institute that embody the idea of "Gateway of Asia" will be opened. We are earnestly examining to construct the foundation matrix of Asia's research within Ritsumeikan. We will take in researchers on Asia and Japan from overseas, formulate an international network, implement diverse, collaborative research and share the findings with the rest of the world.

We have entered our third year in publishing this annual report and the transmission of research results, as well as information disclosure have continued to move forward. The transmission of research results not only serves as a way to give back to the society, but as an inspiration for the researchers involved in their research activities on campus as well. We will continue to aim to be a distinctive, global research university, and create distinguishing research results through the further invigoration of research.

December 2014

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The Researchers that Open Up the Future

We held a round-table discussion to commemorate the three researchers Professor Motoki Kubo of College of Life Sciences, Professor Satoshi Konishi of College of Science and Engineering, and Professor Takanobu Nishiura of College of Information Science and Engineering being taken up by the TBS's TV program of Yume no Tobira that was aired in 2014.

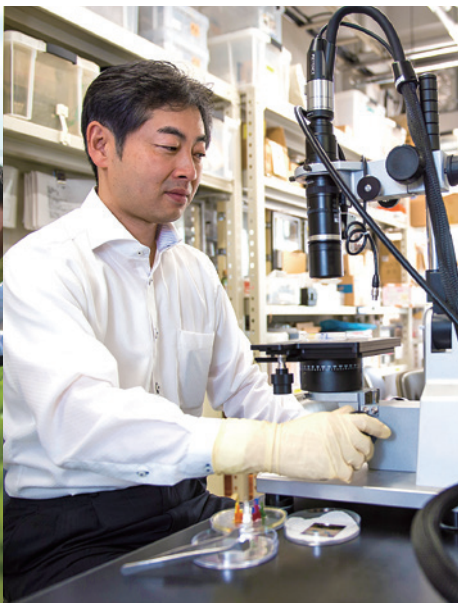
Coordinator

Kozo Watanabe
Vice chancellor
of the Ritsumeikan Trust,
Ritsumeikan University
Vice-President



Motoki Kubo

Professor, College of Life Sciences



Satoshi Konishi

Professor, College of Science and Engineering



Takanobu Nishiura

Professor, College of Information Science and Engineering

Tackling issues without an answer to open the Next Door

Watanabe Today, three professors who were aired on TBS's Yume no Tobira during this year have joined us. For the three that have already been featured on the TV program, we have seen the passion you all have in your area of research. Do you mind giving us a brief introduction into what your research topic is about?

Kubo Originally, my expertise was in the study of environmental microorganisms, and I ended up focusing on the agricultural field as looked for areas that no one has explored before in order to look for ways to contribute to the world. As a result, I arrived at the technology called Soil Fertile Index (SOFIX®) that quantitatively evaluates the amount of microorganisms in the soil and the breakdown as well as the circulation of elements through microorganisms. Employing this technology enables organic farming based on science which has been hitherto dependent on one's hunch and experience. We can realize an improvement in the volume and quality of agricultural products that come from organic farming. Using this technology as the core point, I want to solve the issues that face agriculture in Japan.

Konishi In my research of micromachines, I am trying to find out what we can do by making artificial products smaller, and I am trying to draw out the potential from many angles. Currently, my study centers on the area of life science such as bio and medical. Right now, I am developing a micromachine that can freely grasp and let go without damaging the cellular structure that has been cultured. The other day there was news about the world's very first successful transplant operation of the retina that was created from an iPS cell onto an eyeball. Given the very narrow space such as an eyeball, I believe the day is close where our technology would make a difference in operational procedures that are considered to be very cumbersome.

Nishiura I am involved in the research with a focus on sound creation by using information technology under the concept of "improving the society through sound." For example, technologies such as transforming sound pollution into a pleasant sound by playing something different over it or utilizing ultrasonic speakers where the sound transmits to just one point to prevent sound leakage are findings that are unprecedented in the world. In the end, I want to make sounds that are personalized on an individual basis. Although sound has existed before the

birth of human kind, we have not fully utilized or controlled it. I want to bring about the potential of sound through my research.

What is something that you hold dear as a researcher?

Watanabe You are all deeply engaged in your line of field, and is there something that you hold dear as a researcher?

Kubo I have an engineering background just like the two other professors, and I entered the life science field from studying how to artificially manipulate genes. Yet, throughout my experiment in genetic recombination, I started to feel a sense of discomfort from the thinking based on an engineering mindset that "humans can achieve anything" as quite often 1+1 did not equal 2. Instead I realized that it is more important to take advantage of the nature's structure, and now I am involved in the research of natural circulation and material circulation. It is more important to hold an image that we are "being grown in the vast nature."

Konishi My feelings are also very close to the story of Professor Kubo's. By utilizing tissue engineering, I am trying to create artificial matters that are as close to life as possible, but it is pretty difficult. So I started to shift my thinking, and now I believe that rather than creating an artificial matter that replaces life, why not augment the shortcomings of life by combining the two. I am moving forward with my studies by merging my sincere passion for "creation" following my interests and my desire to contribute to human life. Both are important and I am careful to be impartial.

Nishiura In my research for sounds, I equally feel the awesome power of life. The more I learn about humans, the more I understand that our technology has not caught

up. For example, from high to low, a human voice can cover a wide range of sounds, but the current speaker technology cannot completely cover with one vibrating plate the same range as the humans'. In the same way, microphones have not come close to human ears. The more I pursue technology, I encounter the greatness and profoundness of our functions and structure. I try to keep the stance of learning from humans rather than trying to understand them.

Watanabe You have all started out from engineering, but now you are all intimately connected to the world of life. What is more, I feel that there is an element that you all have in common which is your humility toward research. I believe that humility is tied into great findings.

Innovation in research is created from the fusion and collaboration with different fields.

Watanabe I think one of the characteristics of Ritsumeikan University is its high degree of freedom where researchers can crosscut and go beyond the faculty wall to be engaged in new studies. You are all experts in a sophisticated area of specialty, but at the same time, it seems that you actively partake in studies by merging with different fields. Do you mind telling us your thoughts on collaboration with different fields?

Kubo Yes you are right. When I was younger, there was a tendency on my part to be involved in research with people from the same field, but as I get older, and as my area of research as well as perspectives widen, I began to understand the value of jointly conducting studies with a diverse set of people from different fields. To "make a difference in society," it is necessary to think about issues from many angles. Through the COI-T project, we are aiming for an agricultural innovation that spans from the



Motoki Kubo

Professor, College of Life Sciences

1985 Masters in Engineering, Graduate School of Engineering, Hiroshima University
 1992 Ph.D. in Engineering, Osaka University
 1994 University of Illinois College of Medicine, Monbusho Fellowship Program for Japanese Scholars and Researchers to Study Abroad
 1997 Assistant Professor, College of Science and Engineering, Ritsumeikan University
 2002 Professor, College of Science and Engineering, Ritsumeikan University
 2008 to Present Professor, College of Life Sciences, Ritsumeikan University
 Concentration in environmental microbiology.
 2005 10th Special Memorial Encouragement Award, Ando Momofuku Award

Professor Kubo developed the Soil Fertility Index (SOFIX) which is utilized in collaboration with private sectors in the undertaking of soil creation and cultivation of agricultural crops.

production of food to distribution with a variety of people which encompasses farmers, business enterprises and professors of nutritional science from the College of Sport and Health Science.

Konishi Within my activities in Bio Medical Device Research Center, I interface with professors and doctors of other faculties beginning with College of Pharmaceutical Sciences and College of Sport and Health Science. And exactly because I do not understand their field, I think I am able to objectively view other areas of study with a leveled head. From the opposite end, I began to realize that I am being viewed in the same way, and I have been able to incorporate an objective viewpoint with equanimity. There are many professors at Ritsumeikan who are open to collaborate and it offers an environment that allows for an ease in interdisciplinary studies.

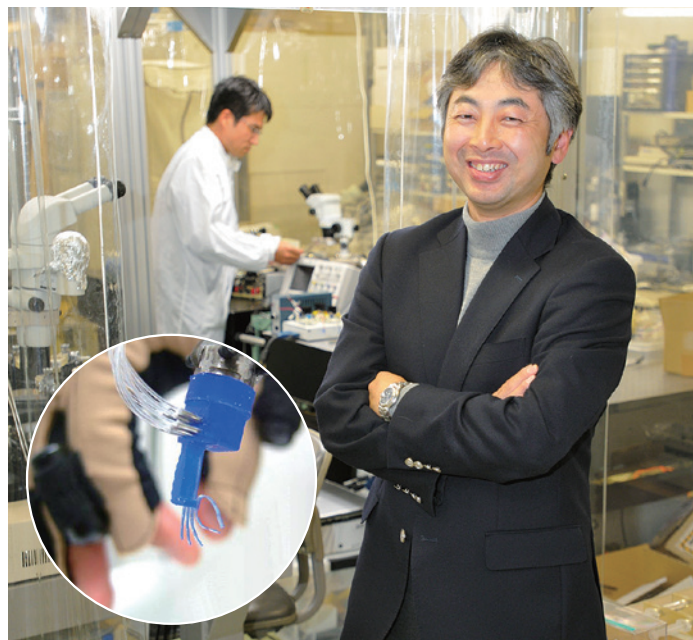
Nishiura Recently, as part of the COI-T studies, I have been jointly working with professors from the College of Business Administration and College of Science and Engineering on social experiments by using one of the speakers we have developed. For example, an experiment of exercising without worrying about noise pollution in the residential area by delivering sounds to a restricted space. Another experiment is how to turn noise pollution into pleasant sounds in a temporary housing in one of the stricken areas from the Great East Japan earthquake. What I found out is that the pursuance of the highest level of technology as a researcher is not necessarily widely and well received by the society. On the other hand, it is important to create the next generation technology. Therefore, I want to be more sensitive to the voices from the field and as we strike a balance, develop a technology that is more readily accepted by the society.

What is important in human resources development from the standpoint of a faculty member?

Watanabe When we look 2 or 3 decades ahead, I think we entered an age where it has become difficult to have dreams. And I think our generation around 60 years of age is responsible. The young people of today never experienced high economic growth. I think their earliest memory began when the Japanese economy started to decline, and then there was the Earthquake. In the midst of this unforgiving environment, what do you think is important in developing human resources who can be leaders in the future?

Nishiura I want our students to do something that can be of help for other people. Many interesting matters or unresolved issues exist outside textbooks, and that is why we are involved in research. If you are able to gain even one thing by tackling something that is unknown in the world, then I think you can be moved in a big way and experience happiness. Creating the spiral as you pursue something useful, no matter how small, while enjoying the happiness is important in developing human resources that can lead the future. In reality, there are 40 students in my laboratory and they bring in different ideas on a daily basis. As I see them argue over their ideas, I see that this transforms into technologies or concepts that will be helpful to others.

Konishi I have given this a lot of thought, but I think as long as you become honest to what kind of soul or identity you have, then all is well. I believe one's comfort level changes throughout the growth process, but I think that sense of honesty is very important. Our studies in high school or college are a means to realize what you want to do in accordance to that feeling. And you do not need to spend a lot of time, but try to make time to ask yourself



Satoshi Konishi

Professor, College of Science and Engineering

1996 Ph.D. in Engineering, School of Engineering, The University of Tokyo
 1996 Full-time Lecturer, College of Science and Engineering, Ritsumeikan University
 1999 Assistant Professor, College of Science and Engineering, Ritsumeikan University
 2002 Research Associate, California Institute of Technology
 2006 to Present Professor, College of Science and Engineering, Ritsumeikan University
 2007 to Present Visiting Professor, Shiga University of Medical Science (concurrent post)
 2009 to Present Collaborative Professor, Graduate School and Faculty of Pharmaceutical Sciences (concurrent post)
 2010 to Present Director, Bio Medical Device Research Center
 2011 Visiting Professor, Free University of Brussels
 Concentration in micromachines, MEMS.
 2005 Japan Society of Computer Aided Surgery, Lecture Thesis Award
 2005 IEEE MHS 2005 Best Paper Award
 2007 The Nikkan Kogyo Shimbun, MONODZUKURI Special Collaboration Award
 2010 IEEE EDS Kansai Chapter of the Year Award
 2014 The IEICE Electronics Society Technical Committee on Integrated Circuits and Devices, awarded Young People's Lecture Award

"Micro-hand μ TAN" that was developed by Professor Konishi is made from silicon rubber, and with 5 fingers measuring 1mm in width at the tip of the arms, each finger can be moved freely as required.

what you want to do in 10 years. There are also about 30 students in my laboratory, but there is something very exciting when their energy of "doing something they want" ties into results.

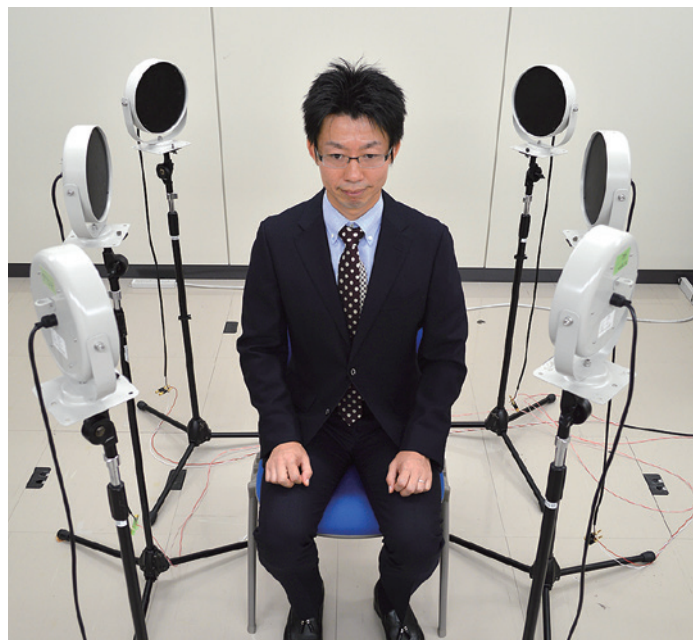
Kubo I think it would be important to recognize again what has not been given focus or what has been overlooked in the last 30 years. For example, in the field of agriculture, due to the low level of labor productivity younger people are turning away from the profession which has led to the problem of aging population. On the political level on the other hand, the debate over TPP continues and construction of a strong agricultural system that can stably produce safe and sound as well as high quality agricultural products on an international level will become increasingly more important. I think it is important to nurture human resources who can determine the problems that Japan or the world would face in the coming days and propose solutions with a global perspective. Giving the difficulty in problem setting, our role as researchers or educators will be further under scrutiny.

Your "dream" as a researcher from now on

Watanabe We have asked the professors who have been aired on Yume no Tobira to join us, but in closing, would you like to share what your dreams are in the coming days?

Nishiura I want to create a society where one will not experience stress through sounds. There have been many problems in the world as a result of sounds, but there are also many things that can be solved by them. I am going to keep trying to create a world where one will not experience stress and where there would be no trouble as a result of sounds.

Konishi I want to do something big with small machines.



Kozo Watanabe

Vice chancellor of the Ritsumeikan Trust, Ritsumeikan University Vice-President

1981 Coursework completed without degree, Graduate School of Cultural Anthropology, Graduate School of Arts and Sciences, University of Tokyo
2003 Ph.D. in Literature, Ritsumeikan University
1981 Full-time Lecturer, Kunitachi College of Music
1986 Assistant Professor, Kunitachi College of Music
1994 Professor, College of Letters, Ritsumeikan University
2003 Professor, Graduate School of Core Ethics and Frontier Sciences, Ritsumeikan University
2012 to Present Vice-Chancellor of Ritsumeikan Trust and Vice President, Ritsumeikan University
Authorship: Body, History, Anthropology by Gensousha; Birth of Legal Identity by Gensousha; Fighting Levi-Strauss by Heibonsha.

I want to create a macro (big) effect, but to do something extraordinary, I need to understand the micro (small) side of it too. I want to do something that is amazing which is borne out of two viewpoints. And one of them is life science, human body, or life that I am involved with right now.

Kubo This may be outrageous, but my dream is to make a difference in society by changing the food system and agricultural system of Japan while virtually changing the entire social structure system from inorganic to organic. My personal dream is to be able to turn the wheel of the world for a split second. It is my final goal to feel even so slightly that I made a difference. (laughter)

Takanobu Nishiura

Professor, College of Information Science and Engineering

2001 Ph.D in Engineering, Graduate school of Information Science, Nara Institute of Science and Technology
2001 Assistant, Faculty of Systems Engineering, Wakayama University
2004 Assistant Professor, College of Information and Engineering, Ritsumeikan University
2014 to Present Professor, College of Information and Engineering, Ritsumeikan University
Concentration in Acoustic Engineering.
2009 VRSJ Outstanding Paper Award

"Micro-area audio spot" that was developed by Professor Nishiura emits ultrasound waves separately from 3 speakers directed at one ear. As a result, audible sounds such as voice or music will be reproduced near the ear.

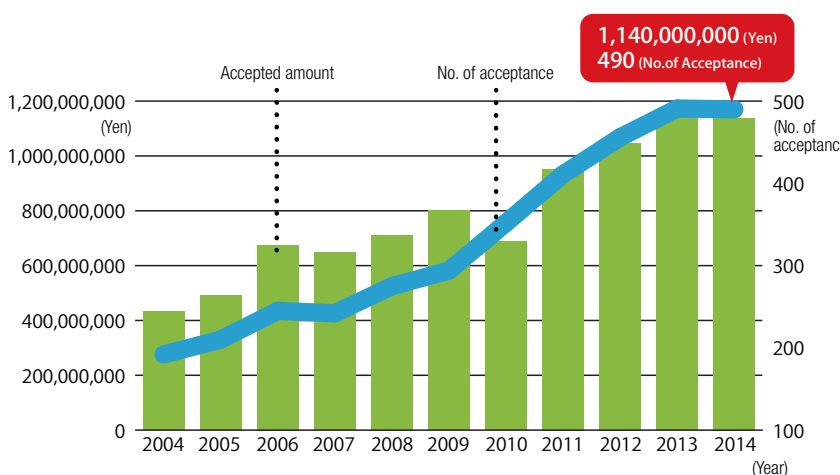
Grants-in-Aid for Scientific Research

—KAKENHI—

Ritsumeikan University placed 26th in the nationwide ranking of the amount and number of acceptance in the AY2014 Allocation of Grants-in-Aid for Scientific Research-Research Funds. Among private universities, the university came in third after Keio University and Waseda University (first place among the private universities in Western Japan), and fourth in terms of its ranking in number of acceptance (first place among the private universities in Western Japan).

The university gained the top position nationwide in the three research fields of Human Geography, Business Administration and Sociology as the distinguishing feature in the Grants-in-Aid for Scientific Research. Furthermore, the acquisition of the top position in three research fields ranks in order after Waseda University and Keio University.

Changes in the amount of funding and number of acceptance from the Grants-in-Aid for Scientific Research for Ritsumeikan University



What is Grants-in-Aid for Scientific Research -KAKENHI-?

Various research activities take place in the universities and research institutions around the country. KAKENHI is a system that aids the researchers necessary funds for such research activities, and targets every original and pioneering "academic research" projects from basic to applied fields that encompass all areas beginning with humanities and social sciences to natural sciences.

*Excerpt from the AY2014 Grants-in-Aid for Scientific Research pamphlet (publisher: MEXT, Japan Society for the Promotion of Science.)

Research Funds Ranking

■ Research Funds Ranking: Amount

1	Keio University
2	Waseda University
3	Ritsumeikan University
4	Nihon University
5	Juntendo University
6	Tokyo University of Science
7	Kinki University
8	Tokai University
9	Doshisha University
10	Meiji University

■ Research Funds Ranking: No. of projects (selected)

1	Keio University
2	Waseda University
3	Nihon University
4	Ritsumeikan University
5	Juntendo University
6	Tokai University
7	Kinki University
8	Tokyo University of Science
9	Kitasato University
10	Meiji University

■ The University's ranking for no. of acceptance among the top 10 institutions (accumulative number of new acceptance in the past five years) by research field

Excerpt from the report published on October 10, 2014 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on AY2014 Allocation of Grants-in-Aid for Scientific Research (grants-in-aid portion, endowment portion).

[No.1 nationwide: 3 disciplines] * Including national universities



[No.1 among private universities: 15 disciplines] * Excluding disciplines with the No.1 ranking nationwide.

(formerly) Computer System Network, (formerly) Separated Information Processing, Intelligent Robotic System, Multimedia Database, High Performance Computing, Information Security, Human Interface Interaction, Life/Health/Medical Informatics, Information Library Science/Humanistic Social Informatics, Environmental Social System, (formerly) Environmental Impact Analysis/Environment Policy, Geography, Gender, Philosophy/Ethics, History of Ideas, Nano/Microsystems

(Note): Titles of research fields designated as (formerly), are those that have been substantially revised in accordance with the revision of research fields of AY 2013; therefore, the number of acceptance has been calculated by adding up those between the three academic years of AY 2010 to AY 2012.

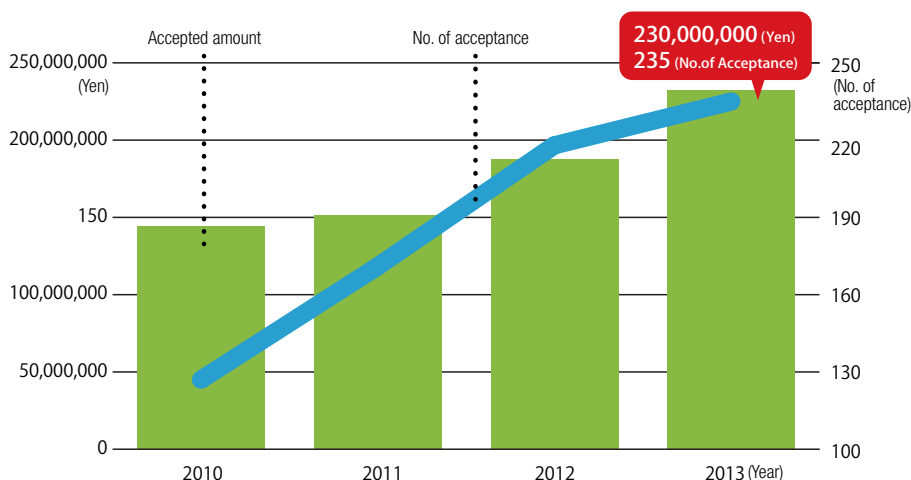
*AY 2014 amount and no. of acceptance (new + on-going), for private universities only.

Commissioned research funds from private-sector industries

From the findings of AY 2012 Industrial-Academic-Government Collaboration Implementation Status of Universities published by MEXT, Ritsumeikan University was ranked at the top position (number of cases: 235) for the first time for its "number of commissioned research implemented

from private-sector industries (in the finding of AY 2011 last year, the university ranked second out of 218 cases). This is one of the accomplishments from the university's overall efforts to secure external research funds throughout the industry-academic-government activities.

Changes in acceptance of commissioned and collaborative research, as well as KAKENHI



What is commissioned research?

Commissioned research is research conducted as public service on behalf of external institutions such as private-sector industries that are undertaken by national universities, Inter-University Research Institute Corporation, National

Institution for Academic Degrees and University Evaluation, and Center for National University Finance and Management. Consequently, the target of research will be limited to projects funded by the consignors to cover necessary expenses.

Number of commissioned research implemented from private-sector industries (AY 2012)

1 Ritsumeikan University
2 Waseda University
3 Kinki University
4 Tokyo Women's Medical University
5 Nihon University

6 Tokyo University
7 Keio University
8 Tokai University
9 Tokyo Institute of Technology
10 Showa University

From the AY 2012 Industrial-Academic-Government Implementation Status of Universities published by MEXT.

Ministry of Education, Culture, Sports, Science and Technology-JAPAN The Center of Innovation (COI) Program (COI STREAM)

At Ritsumeikan University in October 2013, under the Center of Innovation Program (COI STREAM) (hereinafter, COI), two bases have been chosen as the COI Trial base (COI-T). Out of the total of 190 applications, our university is the only one

among private universities to have had two cases selected for COI-T. The two bases that were selected are both on-going research projects that are taking place at the Ritsumeikan Global Innovation Research Organization (R-GIRO).

Developing of a Regional Model for "Slow & Local" Innovation in the Food and Agriculture Industries

Project Leader

Chihiro GOTO
General Manager of Marketing Planning, AEONRETAIL Co.,Ltd.

Research Leader

Motoki KUBO
Professor, College of Life Sciences
Group Leader, Food Supply Research Area of R-GIRO

Participating institutions

AEON RETAIL Co.,Ltd., Ritsumeikan University, AEON AGRI CREATE Co.,Ltd., Kusatsu City, TANEYA Co.,Ltd., Panasonic Corporation Appliances Company, Marubeni Corporation, Community Development Project for Food System in Moriyama, Ritsumeikan Co-op., CTI Engineering Co.,Ltd.

Research outline

In the next decade, people's preferences over food will significantly change, and a paradigm shift from fast food to slow food, and from globally based to locally based food is projected to occur. Taking this situation into account, we will create "Slow and Local Innovation of Food and Agriculture." This "slow innovation" will tie the latest technology and new meaning, as well as value into Japan's traditional natural circulation model on agriculture and food. Consequently, this "local innovation" will create a structure that generates a success model one after another on local production and consumption with regard to agricultural products, as well as sixth sector industrialization. This activity will stimulate the local regions which encourages the flow of people to the suburbs and away from urban areas, resulting in the creation of rich regional culture.

Accepted amount of research funds

20,000,000yen



Health Innovation to Promote Exercise in Life

Project Leader

Sonoko ISHIMARU
Manager, Comfort Engineering Center, Corporate Research Center, TOYOBO Co.,Ltd.

Research Leader

Tadao ISAKA
Professor, College of Sport and Health Science
Leader, Medical treatment & Health Research Area of R-GIRO

Participating institutions

TOYOBO Co.,Ltd., OMRON HEALTHCARE Co., Ltd, Panasonic Co.,Ltd., Daiwa House Industry Co., Ltd.,Higashi Osaka Stadium Co.,Ltd., Kinki University, Shiga University of Medical Science

Research outline

Lifestyle improvement; extension of healthy life-span through exercise; healthy development of children; and the revival of the connection between family and local region are prerequisites for the realization of the ensured sustainability as an advanced nation with a declining birthrate and aging population. Subsequently, "health," "community formulation," and "safety and security" become the basis for these. This base's final goal is to create an "active health community that turns fitness through exercise into life culture" by developing a space or an environment or wear that "makes one want to exercise," rather than "making one to exercise." To make that come true, the three technologies of "smart wear," "spatial sharing," and "exercise induction" will be coordinated and integrated with an aim to commercialize an exercise induction system that utilizes behavioral science which helps sustain exercise without strain.

Accepted amount of research funds

19,500,000yen



Research Vision

Ritsumeikan University formulated the “Ritsumeikan University Research Enhancement Mid-Term Plan (AY 2006-2010)” in 2006. It has been designated as the Phase I Research Enhancement Mid-Term Plan, and the Research Enhancement Mid-Term Plan formulated in 2011 has been designated as the “Ritsumeikan University Research Enhancement Plan Phase II (AY 2011-2015)” (henceforth, the

“Phase II Plan”), representing a five-year plan.

The Phase II Plan has defined the following goals to take action toward the realization of the “Challenge to Create a Distinctive Research University which Contributes to Humanity, Nature and Society,” which is part of the vision of the Ritsumeikan Trust toward the year 2020.

Principles of Research Enhancement

- (1) By giving the knowledge and results gained through research activity back to education and providing society with the fruit of research results, contribute to the welfare of mankind, social progress, world peace, and the development of local communities.
- (2) Promote research that sets of Ritsumeikan University apart by emphasizing both scientific research based on the free, creative intellectual interests of individual researchers, and policy-driven research emphasized by the university, and by integrating them at times.
- (3) Increase functions that integrate research and graduate school education and endeavor to develop young researchers.
- (4) Strengthen collaboration with overseas research institutions and promote the internationalization of research activity and dissemination of research results both inside and outside of Japan.
- (5) Promote research activity in collaboration with national and local governmental agencies, private-sector industries, non-profit agencies and other organizations.

Basic Goals

- (1) Establish Ritsumeikan University as a university with top-class domestic research capabilities and aim for recognition as a university with a unique research base and research fields as well as high international standards.
- (2) Constantly strive for even higher research standards, and promote the creation of a climate where researchers ambitiously engage in research and the creation of a research environment which supports research activity.
- (3) Through industrial-academic-government partnership activities, promote commissioned and collaborative research with national and local government agencies and industry, and use the research results to benefit society, therefore giving back to society.

Implementation Policies for Goal Attainment

- (1) Promotion of original and diverse research
- (2) Creation a world-class research base
- (3) Reinforcement of the activity bases of research organizations, research institutes and research centers
- (4) Promotion of the internationalization of research activity
- (5) Strengthen the dissemination of research results both in Japan and overseas
- (6) Development of young researchers and others who will lead the next generation
- (7) Creation and expansion of a research environment and research support functions
- (8) Promote using research results to give back to society
- (9) Disseminate information on the status of research activities

Strengthening Basic Research

Promotion of Diverse Research with a Focus on Grants-in-Aid for Scientific Research

At Ritsumeikan University, we implement research support systems within the University budget, which lead to the acquisition of external grants such as Grants-in-Aid for Scientific Research (henceforth, KAKENHI), and endeavor in the development and enrichment of research content, a process on which we place great importance. As a result, the number of proposals selected for KAKENHI considerably

increased from 210 in 2005 to 478 in 2013 (the rank rose from number 40 nationwide in 2005 to number 26 in 2013). Ritsumeikan University will continue to position KAKENHI as a key source of external research funding, make efforts toward increasing the number of selected proposals and the monetary amount, and promote basic research.

Expansion of the Advanced Research Programs at Ritsumeikan University

We are endeavoring in the expansion of our research capabilities and have established the following various

Advanced Research Programs:

Advanced Research Programs at Ritsumeikan University

(1) Program to Support General Research Activities (Kiban-kenkyu)

This is a research grant to support and strengthen diverse research within the university, and is a system that aims to actively introduce external research funding such as KAKENHI to further develop and promote research content.

(2) Program for Application of the Grants-in-Aid for Scientific Research (KAKENHI)

The purpose of this system is to support applications the following year for rejected research topics in which a researcher applies for KAKENHI as a Principal Investigator.

(3) Program for Research of Young Scientists (Wakate-kenkyu)

This system supports and strengthens scientific research by young scientists at the university.

(4) Program for Post Doctoral Fellowship

The purpose of this system is to expand a wide range of basic research by the Ritsumeikan University faculty and promote the creation of research results by increasing the number of young research staff in addition to developing young researchers who can be active in educational and research institutions and industries, etc. (as researchers) both domestically and abroad.

(5) Program for Promotion of International Research

The purpose of this system is to promote the international dissemination of research results in order to promote the enhancement and internationalization of research activity.

(6) Program for Overseas Travel Support

This system subsidizes travel expenses required to present

the results of research or create international networks for the purpose of promoting the international dissemination of research findings.

(7) Program for Promotion of Academic Publication

The purpose of this system is to support outstanding research results in specialized fields and young researchers, as well as promote the international dissemination of research results in foreign languages such as English.

(8) Program for Research Institute Mission

This system supports the endeavors for focused projects based on the comprehensive plan established by each laboratory. The purpose of this program is to promote the development of young researchers in addition to creating a positive reputation for the laboratory.

(9) Program for Core-to-Core Research

The purpose of this system is to establish a world-class research hub (Global COE Program, MEXT) that meets the standards of Ritsumeikan University from a mid- to long-term standpoint.

(10) Program for the Second-Phase R-GIRO Research (Core Topics for Ecology, Humanity and Society)

The purpose of this system is to create a new core for a research hub specifically for research areas which Japan must urgently solve (environment, energy, food, materials/resources, medical care/ health, peace of mind/safety, people/way of life, peace/governance, Japan research/area studies) at the Ritsumeikan Global Innovation Research Organization, which is under the direct supervision of the University President, while developing the young researchers who will lead the next generation.

Creation of new businesses and services through practical application and social implementation of research findings

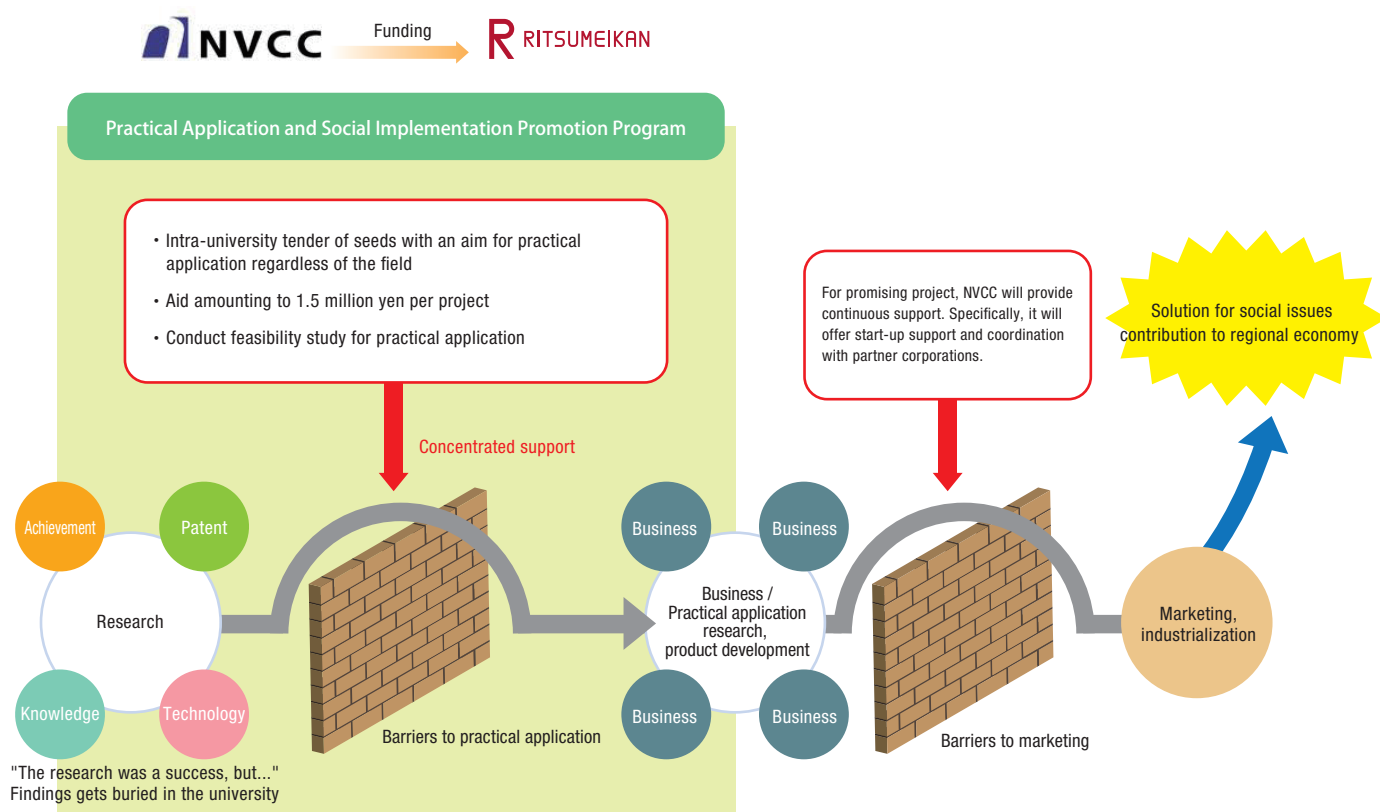
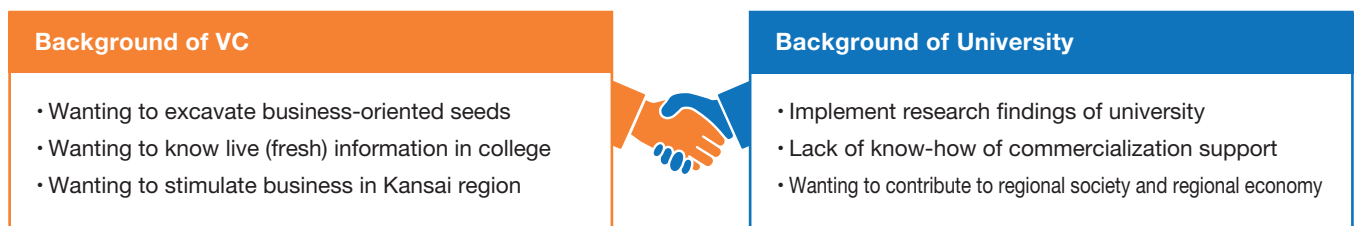
There is demand for universities to create new businesses and services through the practical application and social implementation of research findings while seeking solutions for social issues and making contributions toward industries and the economy.

Under the cooperation of Nippon Venture Capital Co., Ltd. and through their donation, the university has launched the Practical Application and Social Implementation Promotion Program to advance the return of technology transfer and research findings back to the society.

There was an intra-university offering of aid for research

findings, regardless of the field or area of studies, with a certain amount of footing. The criteria stipulated that the area of research to have clear understanding of its technologies or knowledge that serve as the core of practical application and social implementation with potential for the creation of new products and services that have applicable qualities. 12 cases were selected among 34 applicants (Humanities and Social Sciences 8 cases, Natural Sciences 26 cases). Research activities will continue toward practical use and social implementation in the future.

Implementation support in coordination with Nippon Venture Capital Co., Ltd. (NVCC) (image of program)



List of Applicants Selected for the Practical Application and Social Implementation Promotion Program

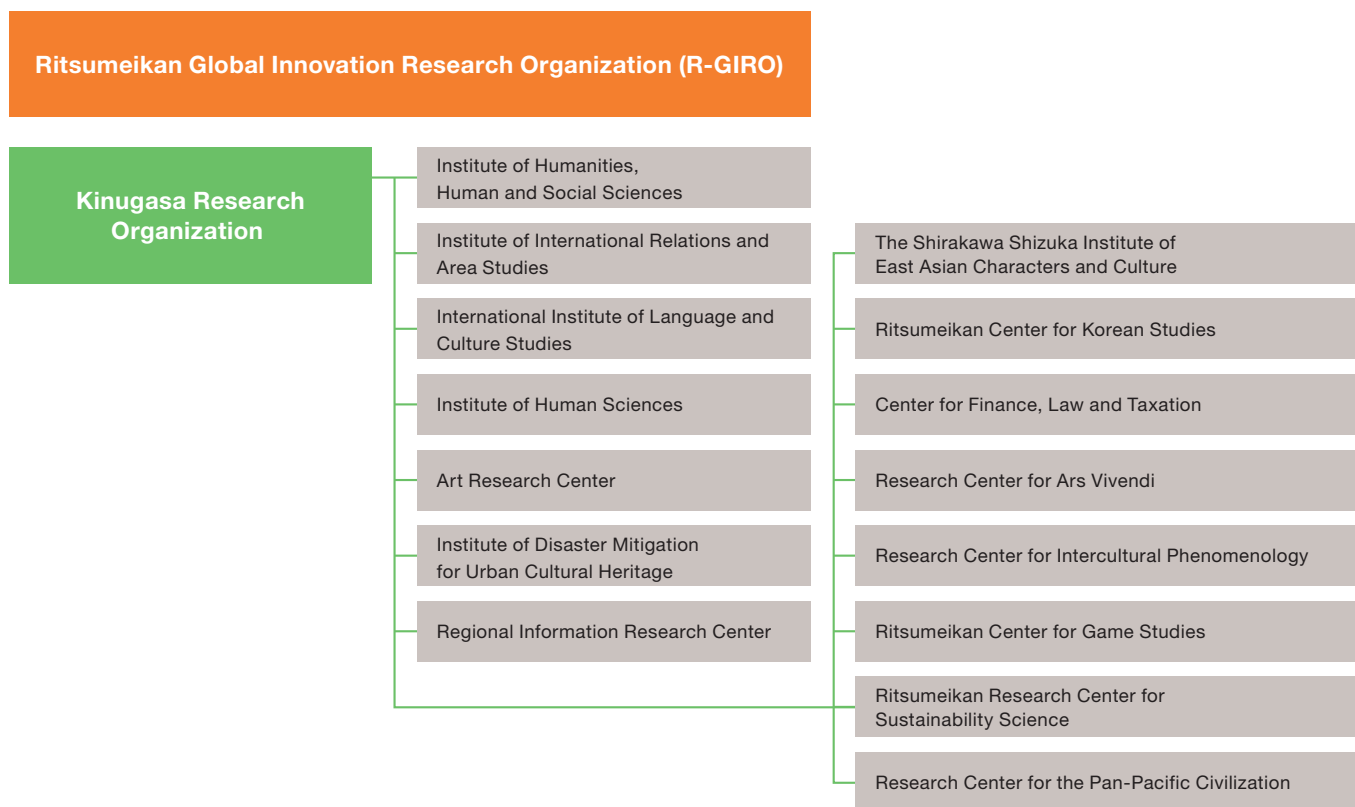
Leaders	Department	Position	Research Project
Ami TANAKA	Science and Engineering	Tokunin Assistant Professor	Production of battery-less, wireless incontinence sensor system and application toward diapers by using urine-powered generator.
Mitsuyuki INABA	Policy Science	Professor	Grasping of issues from minutes and issues extraction method, as well as development of a system that utilizes multidimensional visualization method.
Tetsuo YOSHIMOTO	Business Administration	Professor	Reference model construction of work-site support system for small to mid-scale farming households based on inclusive design concept.
Sadao KAWAMURA	Science and Engineering	Professor	User-friendly and affordable visual feedback robot system.
Satoshi KONISHI	Science and Engineering	Professor	Development of new smart microhand for biological diagnostic treatment by applying engineering, pharmaceuticals and life science.
Kenichiro SUZUKI	Science and Engineering	Professor	Study of high frequency fluid devices that can flexibly adapt to broadband range to realize a wireless network that serves as the infrastructure of a safe and sound society.
Ichiro FUJIEDA	Science and Engineering	Professor	Utilizing the optical fiber that contains a bend in order for the backlight to cover more area and to make it more see-through.
Shugen MA	Science and Engineering	Professor	Establishment of non-destructive testing technology of plumbing by self-propelled robot.
Takeshi KUMAKI	Science and Engineering	Lecture	Development of surreptitious photographing prevention system under an LED lighting environment-to prevent fraudulent activities by smartphones.
Masamitsu FUJIMOTO	Science and Engineering	Assistant Professor	Implementation study of ultrasound moisture and water level measurement technology toward the monitoring system that predicts landslide disaster.
Takahiro WADA	Information Science and Engineering	Professor	Development of passive above-knee prosthetics with knee-joint that can climb stairs.
Hidenao TOYODA	Pharmaceutical Sciences	Professor	Standardization of multi-potent stem cells that aims for safe regenerative medicine; development of bio-marker antibodies that is conducive for standardization.

Research Organizations, Research Institutes and Research Centers

Ritsumeikan University’s research activities are promoted with its four research organizations, Kinugasa Research Organization, BKC Research Organization of Social Science, Research Organization of Science and Technology, and

Ritsumeikan Global Innovation Research Organization (R-GIRO) , as well as the research organizations under the four, as the basis of the activities.

(November.1.2014)

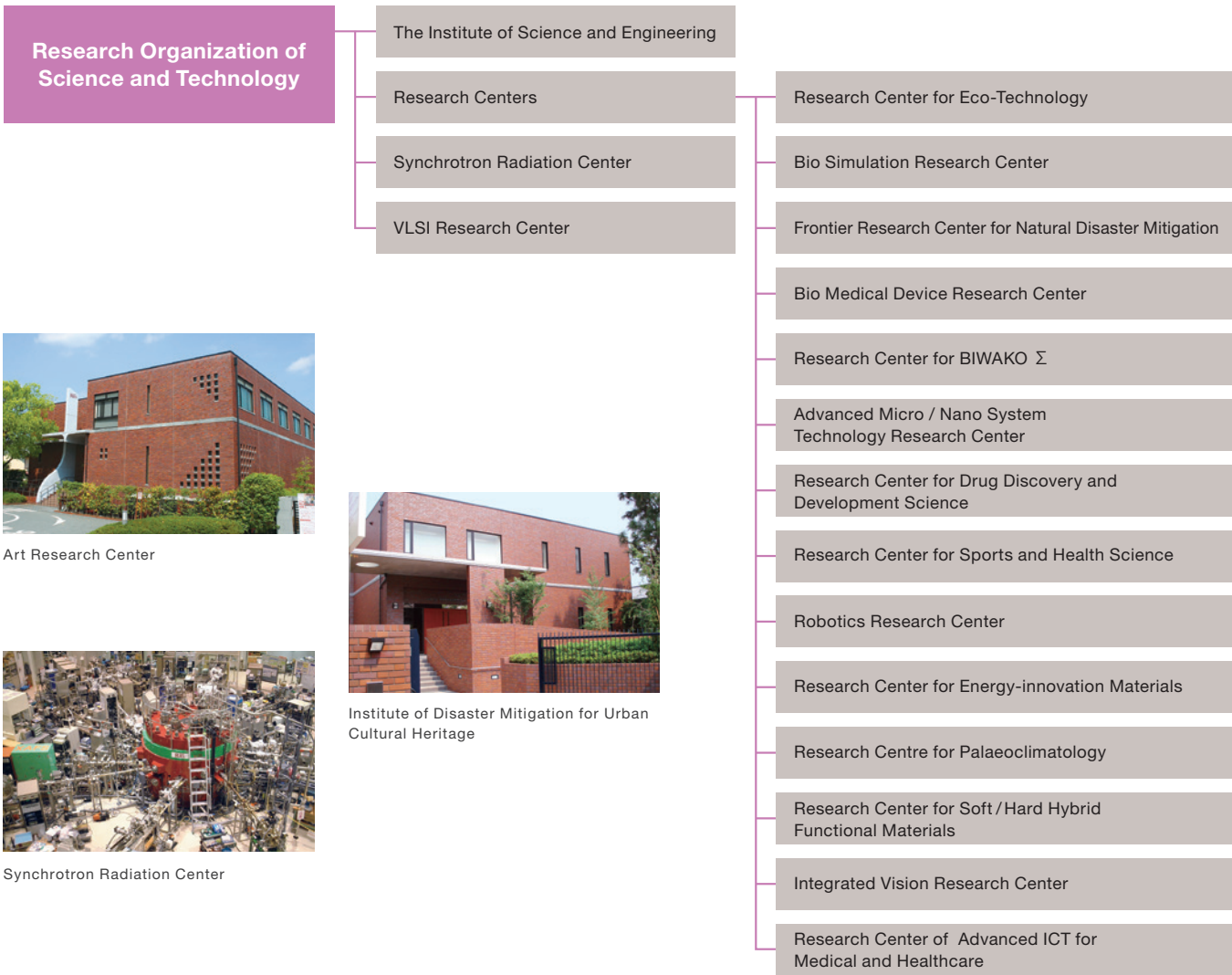
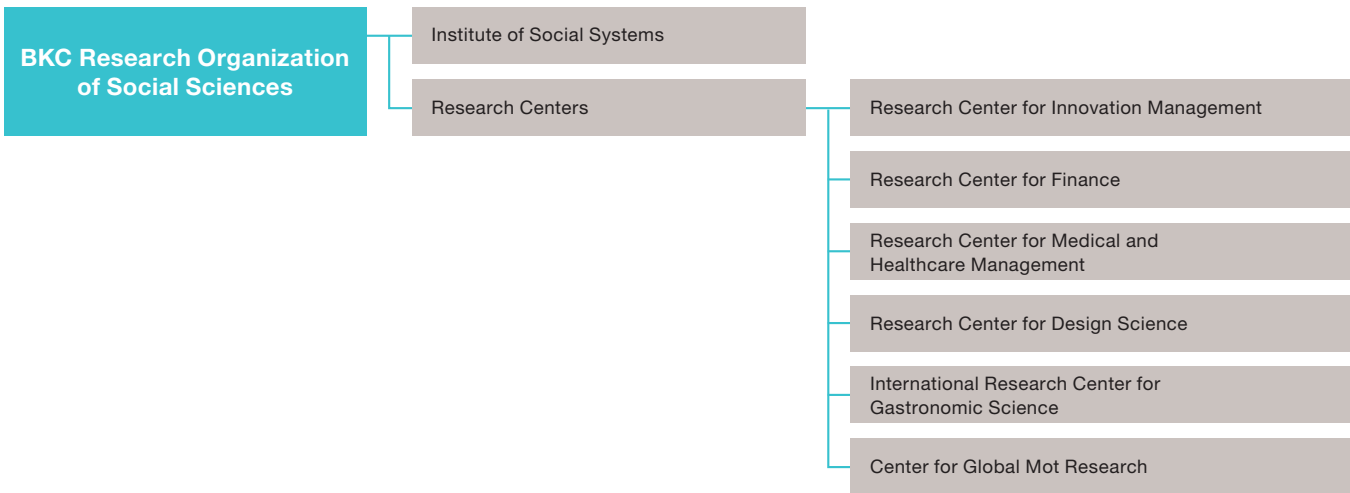


Ritsumeikan Global Innovation Research Organization (R-GIRO)

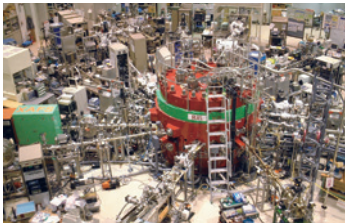
R-GIRO is a research organization under the direct control of the University President, and was established in 2008 with the goal of “forming a research hub specifically for policy-driven research topics” and “strengthening the development of young researchers who will lead the next generation.” The organization’s goal is to contribute to the next generation of society by producing valuable research findings and actively disseminating them through the promotion of interdisciplinary research activity which aims to integrate the natural science fields with those in the humanities and social sciences toward the realization of a symbiotic society that the 21st century demands.

Kinugasa Research Organization

Kinugasa Research Organization was founded in 1998 and it supports research activity as a research organization which manages the research institutes and research centers. The organization’s goal is to contribute to human welfare and social progress under the four principles of “autonomy,” “democracy,” “openness,” and “peaceful use”.



Art Research Center



Synchrotron Radiation Center



Institute of Disaster Mitigation for Urban Cultural Heritage

BKC Research Organization of Social Sciences

Research Organization of Social Sciences (BKC) was founded in 1998 in order to promote research activity in business-related fields, in conjunction with the relocation of the College of Economics and the College of Business Administration to BKC. Its goal is to advance research with greater social connectivity by promoting research which fuses economics, management and technology.

Research Organization of Science and Technology

Research Organization of Science and Technology was established in 1994 as the Research Organization of Science and Engineering (changed to its present name in 2012) to contribute to the development of science and technology and local society. The organization's goal is to contribute to the development of science and technology and contribute to local society through joint research in industry-academia-government partnerships.

Finding answers to climate change and the rise and fall of civilizations through the study of varves Becoming the world's top research site

Research Center for the Pan-Pacific Civilization (Ritsumeikan PPC) Research Centre for Palaeoclimatology

Research Center for the Pan-Pacific Civilizations and Research Centre for Palaeoclimatology have been collaborating academically through the study of varves, and are promoting consistent research activities on the past climate changes and its impact to humans.

Research Center for the Pan-Pacific Civilization(Ritsumeikan PPC)

Founded on April 1, 2013

Ritsumeikan Academy founded Asia Pacific University (APU) and has been a trailblazer in focusing on the importance of nurturing human resources in Japan and the Asia Pacific region, as well as their climate, history, traditional culture, technology, values and life style. Its objective is to address the fundamental reason for the existence of environment and culture, and to find the key for the disasters in the pan pacific region, as well as the rise and fall of civilizations.

The aim for the center's research is to be able to envision Japan's future from the Pan Pacific viewpoint. This will be achieved through the exploration and creation of new civilization value, and the discovery of ways to make societies more sustainable while proposing visions that will open up to the new era of civilization and lastly, to construct

technological innovation and policy, as well as life style that will help complete the aforementioned.

Researchers and research areas are comprised from a wide array of subjects ranging from environmental archaeology, cultural anthropology, disaster geography, Jomon era archaeology, varve environmental history, Mongolian social history, and environmental sociology.

*The center operates under the close collaboration with Saionji-Juku that primarily focuses on working professionals.


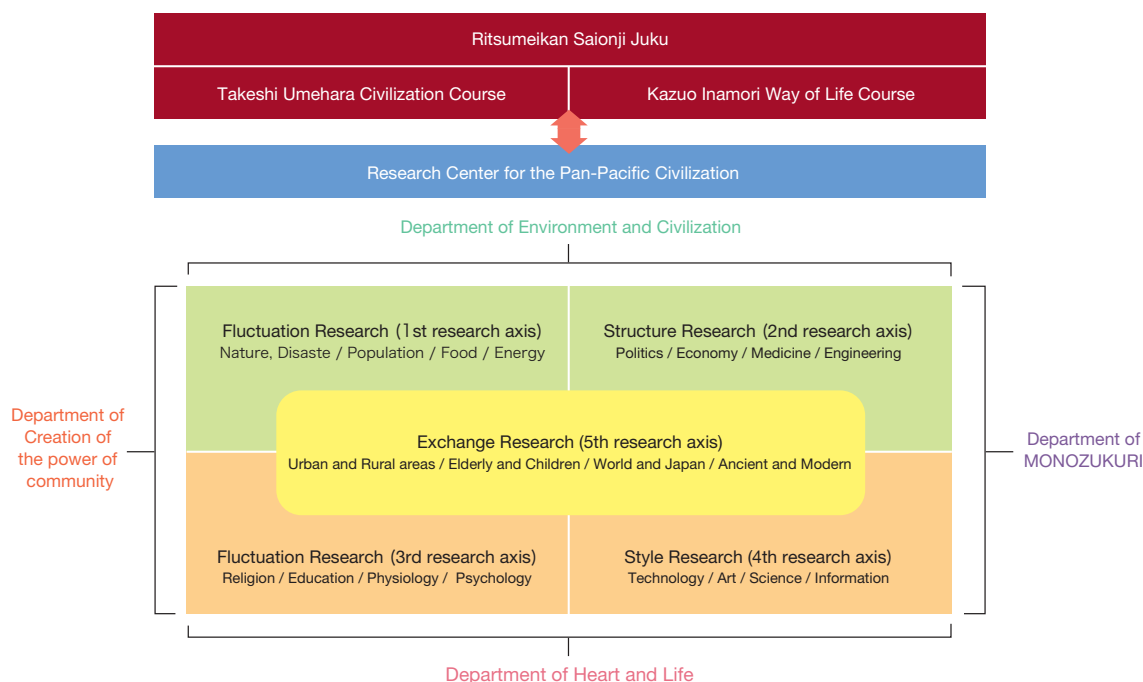
 Details on Research Center for the Pan-Pacific Civilizations
<http://www.ritsumei.ac.jp/research/rcppc/>

Chart of Research Center for the Pan-Pacific Civilization



Research Centre for Palaeoclimatology

Founded on April 1, 2014

The rapid climate change is the largest among the disasters that humankind is facing. The governments around the world share the crisis consciousness that originates from the impact of climate change. For example, the IPCC report (Intergovernmental Panel on Climate Change) has strong influence over policy decisions of each country, including Japan.

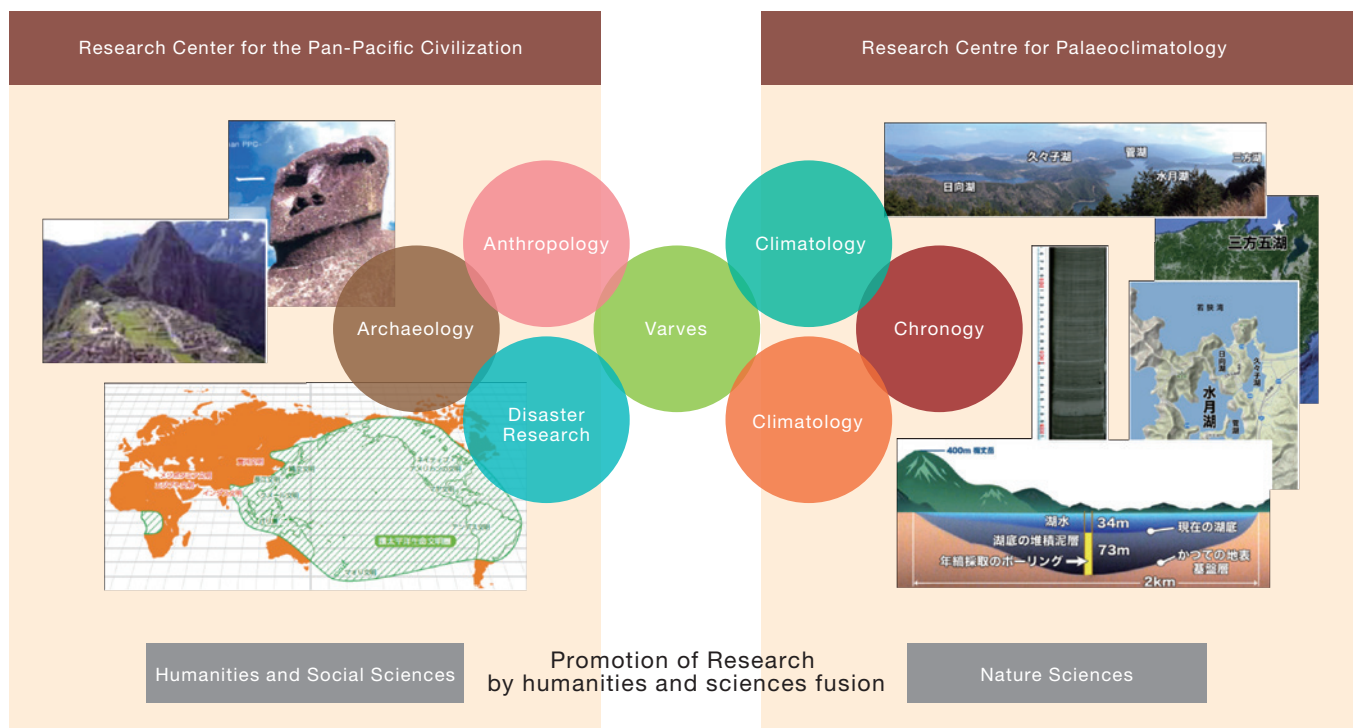
When trying to predict the future climate, it is useful to know what kind of climate change had actually taken place in the past. For that reason, the importance of high quality palaeoclimatological data has been rapidly growing in recent

years. The research center aims to become the leading research base in palaeoclimatology within the human living space. Based on that, there will be collaboration between experts on the polar region, ocean, climate modeling and policy creation with an aim to contribute toward a deepened understanding of the climate system and an improvement in the quality of climate forecasting.



Details on Research Centre for Palaeoclimatology
<http://www.ritsumeikan.ac.jp/research/center/kokikou/>

Academic disciplines of Research Center for the Pan-Pacific Civilization and Research Centre for Palaeoclimatology



Industry-Academia-Government Collaboration Activities

Endeavors Related to Industry-Academia-Government Collaboration Activities

Ritsumeikan University founded the “Biwako-Kusatsu Campus” (henceforth, “BKC”) in order to relocate and expand the College of Science and Engineering in 1994. In conjunction with this, the University established a “Liaison Office,” which served as the office for industry-academia-government collaboration activities, in 1995, and has actively developed industry-academia-government collaboration activities ahead of other universities nationwide. As a result, in 2005 and 2006, Ritsumeikan was a leading figure in the Ministry of Economy, Trade and Industry’s “University Activity Evaluation Method Survey Project (an evaluation of an industry-academia collaboration office at a university, etc. by industry),” where it ranked first place for two years in

a row, receiving high praise from society.

Regarding industry-academia-government collaboration activities, for the Phase II Plan basic goals, the University stated the following as its goal: “through industry-academic-government collaboration activities, promote commissioned and joint research, etc. with national and local government agencies and corporations, and contribute to society by giving research findings of a broad spectrum back to society.” Ritsumeikan University is enhancing its basic foundations to develop industry-academia-government collaboration activities in an organized manner, and aspires to give research results created from these foundations back to society.

Research Introduction

Research Center of Advanced ICT for Medical and Healthcare

MEMS tactile sensor that actualizes a sense of touch akin to human’s

Niigata University, Osaka University,
Novel Functional Devices Laboratory,
Advanced Telecommunications Research Institute International

College of Information Science and Engineering
Professor **Haruo NOMA**



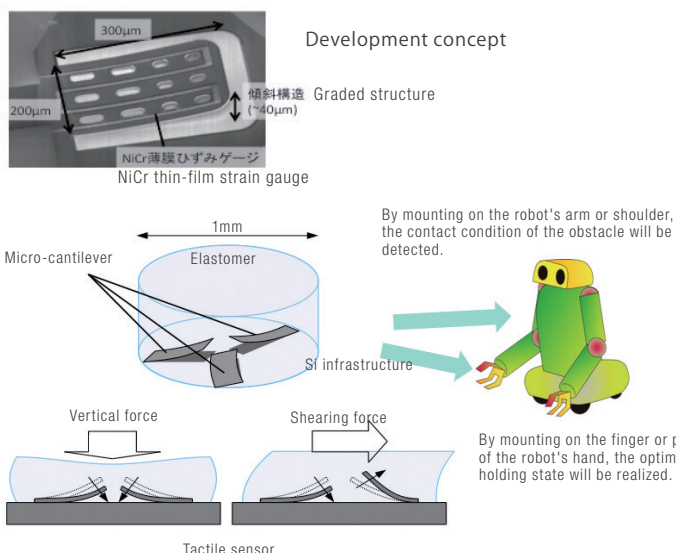
Case Study Outline

Highly developed tactile function is necessary in order to provide a sufficient sense of safety and working property to the human support robot like a caregiving robot that coexists with people to give service. The MEMS technology was applied in this project, and an ultra-small Multi-axial tactile sensor that could be loaded on the fingertips of a robot, which is equipped with human-like functional qualities, was developed.

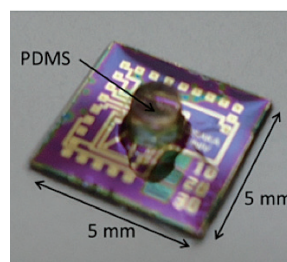
The developed sensor would possess sensitivity against the shearing force of 2 horizontal axes and vertical force, and

is built in a way where the ultra-small cantilever is covered by an elastomer. When the vertical force and shearing force are applied onto the upper surface of the elastomer, the MEMS structure of the entire elastomer will transform, and the changed condition will be electrically detected. By an algorithm that utilizes matrix calculation, it has become possible to simultaneously separate and measure the vertical force and shearing force.

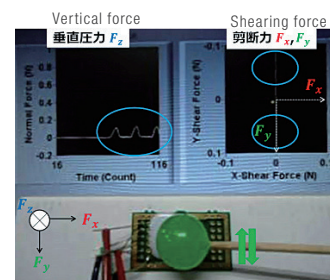
The diameter of the detection part for the tactile sensor that has been built as a prototype is approximately 1mm, and the size of the chip was a minimum of 5mm square. Consequently, we were able to realize a loadable size on the fingertips of the robot.



Developed sensor



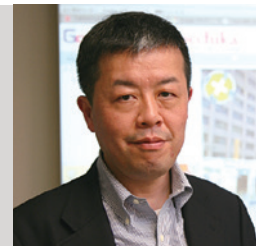
Measurement system



Research Introduction

Anonymous Pedestrian Flow Analysis System using Wi-Fi Packet Sensors

College of Information Science and Engineering
 Professor **Nobuhiko NISHIO**



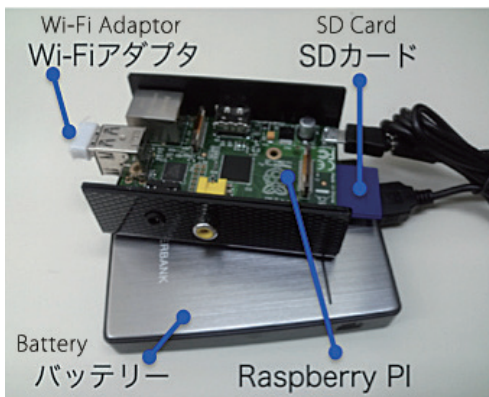
Case Study Outline

A sensor network that can consecutively and regularly observe will be built by receiving the control packet that is regularly transmitted from the Wi-Fi compatible equipment such as smartphones and by placing Wi-Fi packet sensors that anonymously transmit data to analytical servers in many places. From this, people's congestion and flow will be analyzed in real time without specifying the user's personal information. It is an all-purpose system that can grasp the time and space distribution of human flow. Compared with camera-based vision approach, person-trip trajectories could be easily grasped, however, especially for protection

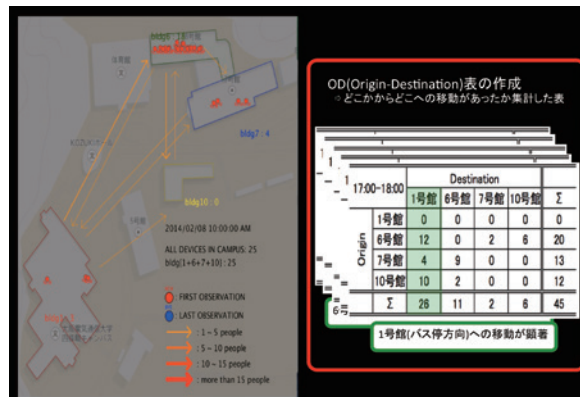
of observed persons' privacy, anonymizing and anti-traceability technology has been developed.

While grasping the human flow pattern by setting up the sensor network in underground shopping area or large shopping malls, surveillance function will be provided too at the same time through the set up of location disclosure in response to the requests made by people with disability that need the assistance of facility managers. The sensor network will function as a social infrastructure that has multi-purpose utilities. For example, it can be utilized in social planning such as disaster prevention planning, urban planning and

traffic planning, as well as for private sector usage in commercial planning.



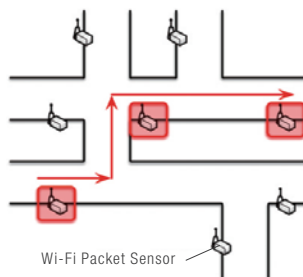
Wi-Fi Packet Sensor



Movement of people in the campus

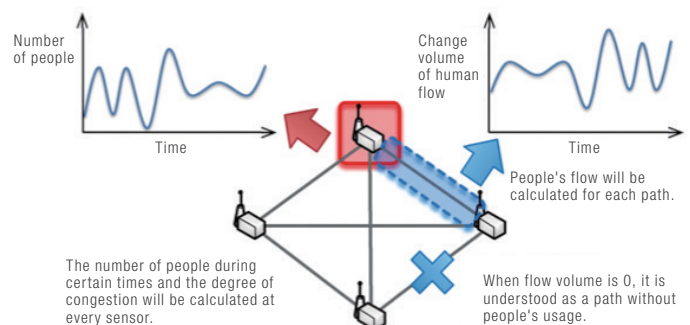
Human flow analysis as particle

- Person trip data will be extracted by focusing on individual movement, and the human flow will be grasped through the creation of an OD (Origin-Destination) table.
- The primary function is to grasp the current location of people under surveillance inside facilities.



Human flow analysis as fluid

- By using the Wi-Fi packet sensors as nodes, a total graph will be created, as the edge will be used to connect the nodes. The number of people at certain time frames or degree of congestion will be calculated for every node.
- Human flow volume will be calculated at each edge. At that time, the edge's flow volume 0 will be considered as a path without people's usage.



		Landing		
		South building exit and entrance	In front of elevator south 1	In front of ○○ company booth
Starting point	South building exit and entrance	100	120	50
	In front of elevator south 1	80	200	50
	In front of ○○ company booth	20	50	230

(1) No. of Faculty and Research Scholars (as of May 1, 2013)

(unit: person)

		Position	Suzaku Campus	Kinugasa Campus	Biwako-Kusatsu Campus	Total
Full-time	Sennin	Professor	24	281	281	586
		Associate Professor	5	116	98	219
	Fixed Term Teaching Staff	"Ninkisei" Professor	7	11	5	23
		"Ninkisei" Associate Professor	0	16	10	26
		"Ninkisei" Lecturer	0	4	17	21
		Assistant Professor	1	11	65	77
		"Tokunin" Assistant Professor	0	0	24	24
		"Tokubetsu Keiyaku" Professor	20	11	3	34
		"Tokubetsu Keiyaku" Associate Professor	1	3	0	4
		"Tokubetsu Ninyo" Professor	4	27	37	68
		"Tokumei" Professor	2	1	0	3
		"Tokubetsu Shohei" Professor	1	10	3	14
		"Tokubetsu Shohei" Associate Professor	0	2	0	2
		Research Professor	0	0	1	1
		Eminent Research Professor	0	5	7	12
		Eminent Research Associate Professor	0	3	0	3
"Shokutaku" Full-Time Lecturer	0	107	15	122		
Part-time	Visiting Professor	13	34	22	69	
	Affiliate Research Professor	0	2	25	27	
	"Tokubetsu Shohei" Professor	0	0	6	6	
	Visiting Research Professor	0	9	6	15	
	Visiting Research Associate Professor	0	1	0	1	
	Part-time Lecturer	18	582	319	919	
Research Scholar	Senior Researcher	0	43	47	90	
	Research Assistant	0	1	2	3	
	Assistant Researcher	0	1	4	5	
	Researcher	0	2	13	15	
	Research Associate	0	0	5	5	
Total			96	1,283	1,015	2,394

● **Suzaku Campus**

School of Law, Graduate School of Management, Graduate School of Public Policy

● **Kinugasa Campus**

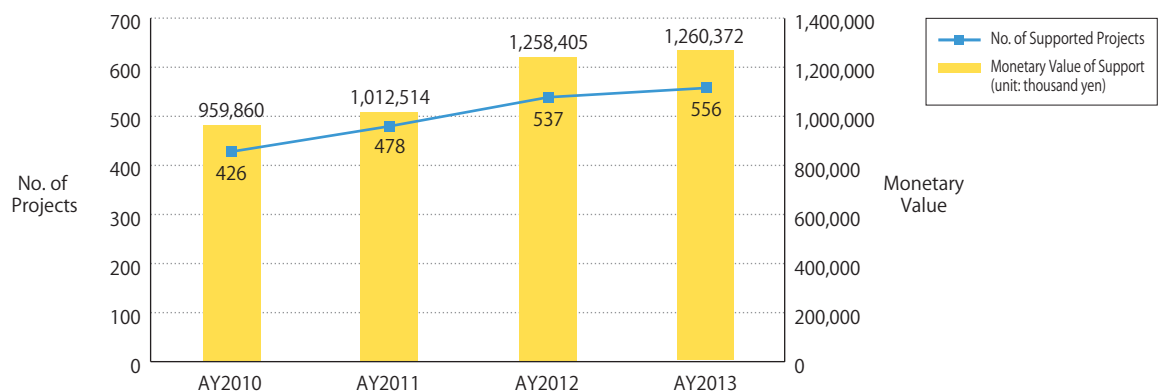
College of Law, College of Social Sciences, College of International Relations, College of Policy Science, College of Letters, College of Image Arts and Sciences, Graduate School of Science for Human Services, Graduate School of Core Ethics and Frontier Sciences, Graduate School of Language Education and Information Science, Ritsumeikan-Global Innovation Research Organization (Humanities and Social Sciences), Kinugasa Research Organization, Others

● **Biwako-Kusatsu Campus**

College of Economics, College of Business Administration, College of Sport and Health Science, College of Science and Engineering, College of Information Science and Engineering, College of Life Sciences, College of Pharmaceutical Sciences, Graduate School of Technology Management, Ritsumeikan Global Innovation Research Organization (Natural Sciences), Research Organization of Science and Technology, BKC Research Organization of Social Science

(2) No. of Projects Supported by Grants-in-Aid for Scientific Research and Monetary Amount (Figures are for March 31 each year)

	AY2010	AY2011	AY2012	AY2013
No. of Supported Projects	426	478	537	556
Monetary Value of Support (unit: thousand yen)	959,860	1,012,514	1,258,405	1,260,372

**(3) Year-on-year Comparison of the No. of Projects Selected for Grants-in-Aid for Scientific Research (Figures are as of the preliminary approval stage for the first grant of each year.)**

		AY2010	AY2011	AY2012	AY2013
No. of Applications		417	472	456	449
Grant awarded (for new projects)	No. of Projects	107	174	160	142
	Amount (unit: thousand yen)	290,720	465,800	454,220	329,420
Grant awarded (for continuing projects)	No. of Projects	234	237	297	335
	Amount (unit: thousand yen)	557,635	486,393	619,848	820,586
Total	No. of Projects	341	411	457	477
	Amount (unit: thousand yen)	848,355	952,193	1,074,068	1,150,006

*Except Grant-in-Aid for Research Activity Start-up (new)

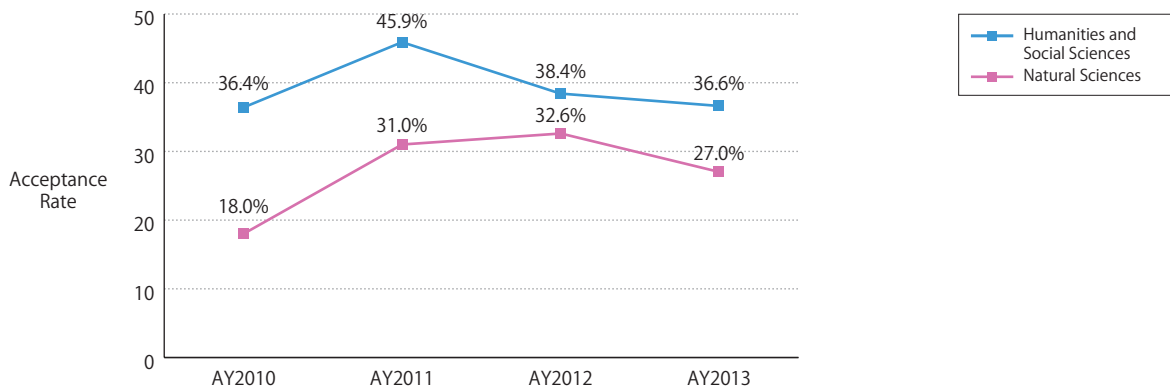
(4) Acceptance Rate of Applications for Grants-in-Aid for Scientific Research and Project-Faculty Ratio (Figures are as of the preliminary approval stage for the first grant of each year.)

① Changes in the Acceptance Rate for Grants-in-Aid for Scientific Research

	AY2010			AY2011			AY2012			AY2013		
	Applications	Accepted Projects	Acceptance Rate	Applications	Accepted Projects	Acceptance Rate	Applications	Accepted Projects	Acceptance Rate	Applications	Accepted Projects	Acceptance Rate
Humanities and Social Sciences	173	63	36.4%	185	85	45.9%	198	76	38.4%	216	79	36.6%
Natural Sciences	244	44	18.0%	287	89	31.0%	258	84	32.6%	233	63	27.0%

Acceptance rate = the No. of accepted projects / the No. of applications x 100

*Except Grant-in-Aid for Research Activity Start-up (new)



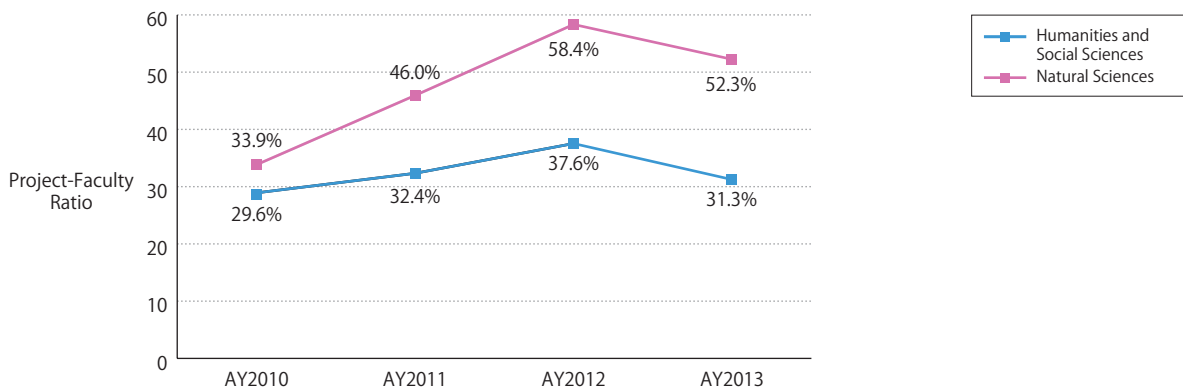
② Changes in the Project-Faculty Ratio for Grants-in-Aid for Scientific Research

	AY2010	AY2011	AY2012	AY2013
Humanities and Social Sciences	29.6%	32.4%	37.6%	31.3%
Natural Sciences	33.9%	46.0%	58.4%	52.3%

Project-Faculty Ratio = No. of accepted projects / No. of faculty x 100

*Except Grant-in-Aid for Research Activity Start-up (new)

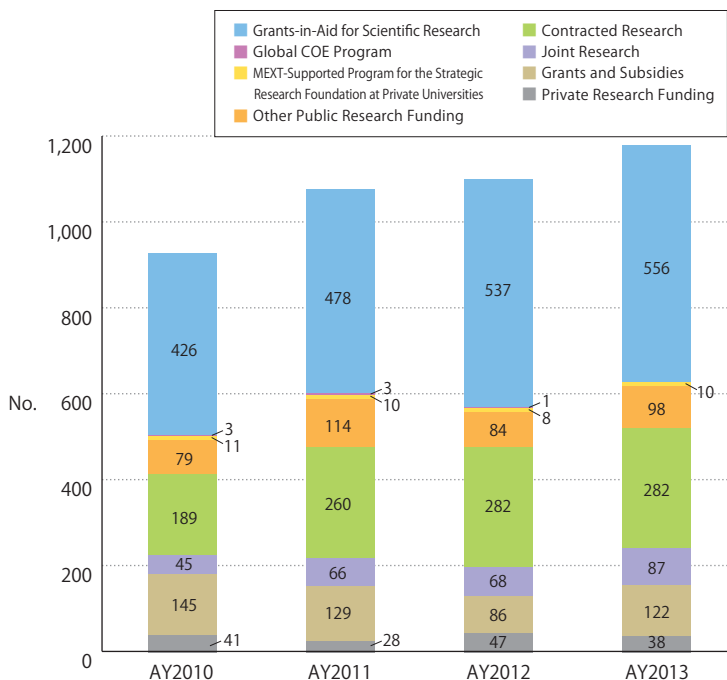
The Project-Faculty Ratio is calculated by dividing the No. of accepted projects by the No. of faculty at Ritsumeikan University.



(5) External Research Funding

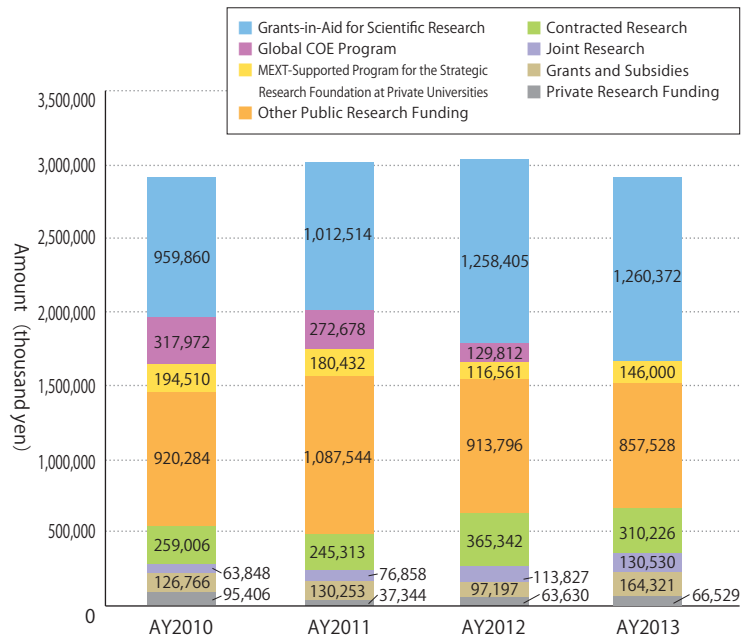
① No. of Projects by Funding Source

	AY2010	AY2011	AY2012	AY2013
Grants-in-Aid for Scientific Research	426	478	537	556
Global COE Program	3	3	1	0
MEXT-Supported Program for the Strategic Research Foundation at Private Universities	11	10	8	10
Other Public Research Funding	79	114	84	98
Contracted Research	189	260	282	282
Joint Research	45	66	68	87
Grants and Subsidies	145	129	86	122
Private Research Funding	41	28	47	38
Total	939	1,088	1,113	1,193



② Monetary Amount by Funding Source (unit: thousand yen)

	AY2010	AY2011	AY2012	AY2013
Grants-in-Aid for Scientific Research	959,860	1,012,514	1,258,405	1,260,372
Global COE Program	317,972	272,678	129,812	0
MEXT-Supported Program for the Strategic Research Foundation at Private Universities	194,510	180,432	116,561	146,000
Other Public Research Funding	920,284	1,087,544	913,796	857,528
Contracted Research	259,006	245,313	365,342	310,226
Joint Research	63,848	76,858	113,827	130,530
Grants and Subsidies	126,766	130,253	97,197	164,321
Private Research Funding	95,406	37,344	63,630	66,529
Total	2,937,652	3,042,936	3,058,570	2,935,506



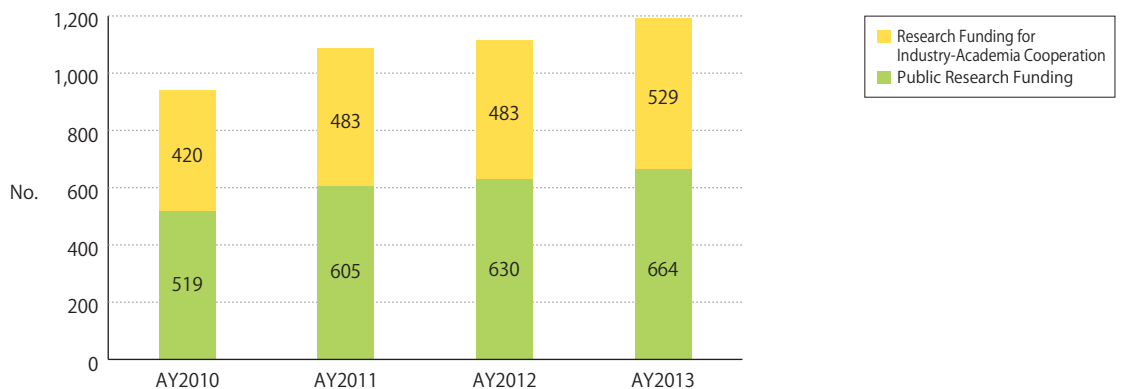
③ No. of Projects by Funding Source (research funding for industry-academia cooperation / public research funding)

(No. of projects)

	AY2010	AY2011	AY2012	AY2013
Research Funding for Industry-Academia Cooperation	420	483	483	529
Public Research Funding	519	605	630	664
Total	939	1,088	1,113	1,193

Research funding for industry-academia cooperation=contracted research, joint research, grants and subsidies, private funding subsidies

Public research funding=Grants-in-Aid for Scientific Research, Global COE Program, MEXT-Supported Program for the Strategic Research Foundation at Private Universities, other public research funding (government subsidies, contracted research, joint research, etc.)



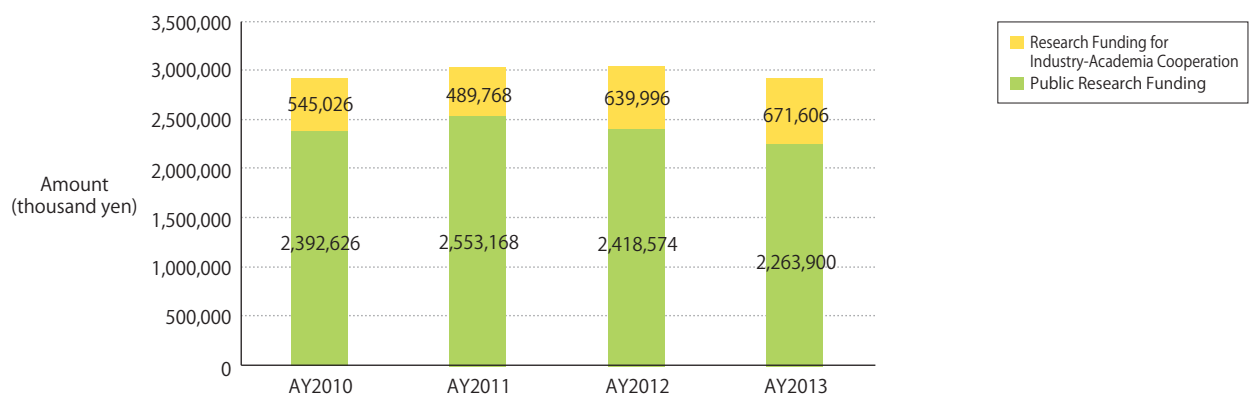
④ Monetary Amount by Funding Source (research funding for industry-academia cooperation / public research funding)

(unit: thousand yen)

	AY2010	AY2011	AY2012	AY2013
Research Funding for Industry-Academia Cooperation	545,026	489,768	639,996	671,606
Public Research Funding	2,392,626	2,553,168	2,418,574	2,263,900
Total	2,937,652	3,042,936	3,058,570	2,935,506

Research funding for industry-academia cooperation=contracted research, joint research, grants and subsidies, private funding subsidies

Public research funding=Grants-in-Aid for Scientific Research, Global COE Program, MEXT-Supported Program for the Strategic Research Foundation at Private Universities, other public research funding (government subsidies, contracted research, joint research, etc.)



(6) No. of Applications / No. of Acceptance/Acceptance Rate / Amount of Advanced Research Programs at Ritsumeikan University (Basic Research) AY2013

	No. of Applications	No. of Acceptance	Acceptance Rate	Amount (unit: thousand yen)
Program to Support General Research Activities (Kiban-kenkyu)	100	42	42.0%	39,800
Program to Support General Research Activities (Kiban-kenkyu for "Disaster Research")	41	22	53.7%	17,800
Program for Application of the Grants-in-Aid for Scientific Research (KAKENHI)	54	52	96.3%	35,500
Program for Research of Young Scientists (Wakate-kenkyu)	144	66	45.8%	39,969
Program for Post Doctoral Fellowship(for new projects)	61	10	16.4%	39,600
Program for Post Doctoral Fellowship(for continuing projects)	18	18	100.0%	71,280
Program for Promotion of Academic Publication	20	12	60.0%	12,000
Program for Promotion of International Research	80	55	68.8%	42,350

(7) No. of Applications / No. of Acceptance / Acceptance Rate / Amount of Advanced Research Programs at Ritsumeikan University (Research Hubs) AY2013

	No. of Acceptance	Amount (unit: thousand yen)
Program for Research Institute Mission	35	39,926
Program for the First-Phase R-GIRO Research (Specific Topics for Sustainable Society)	23	171,000
Program for the Second-Phase R-GIRO Research (Core Topics for Ecology, Humanity and Society)	9	135,632

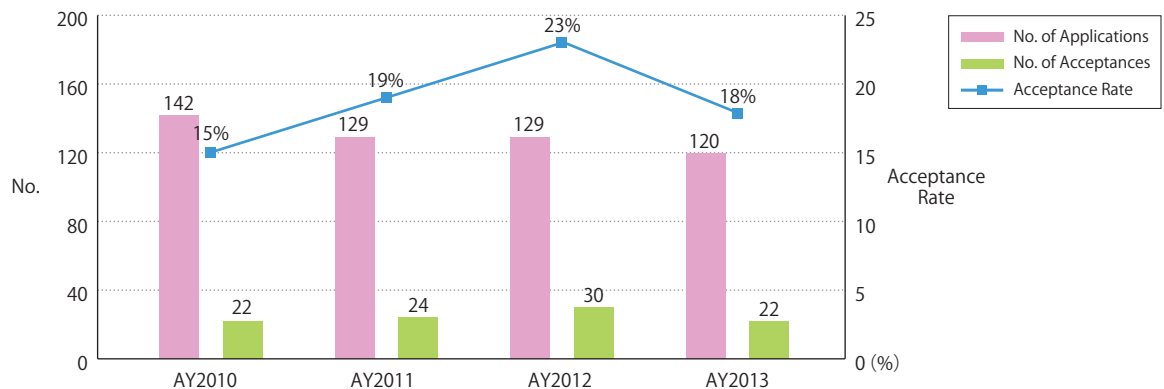
(8) Other internal research grants AY2013

	No. of grants	Amount (unit: thousand yen)
Program for Overseas Travel Support	62	3,978
Operational Grant for Academic Conferences	26	1,420
Individual Research Allowance (Material Allowance)	1,172	231,050
Individual Research Allowance (Travel Allowance)	925	100,999

(9) No. of Applications / No. of Acceptances / Acceptance Rate of Research Fellowships for Young Scientists

(unit: person)

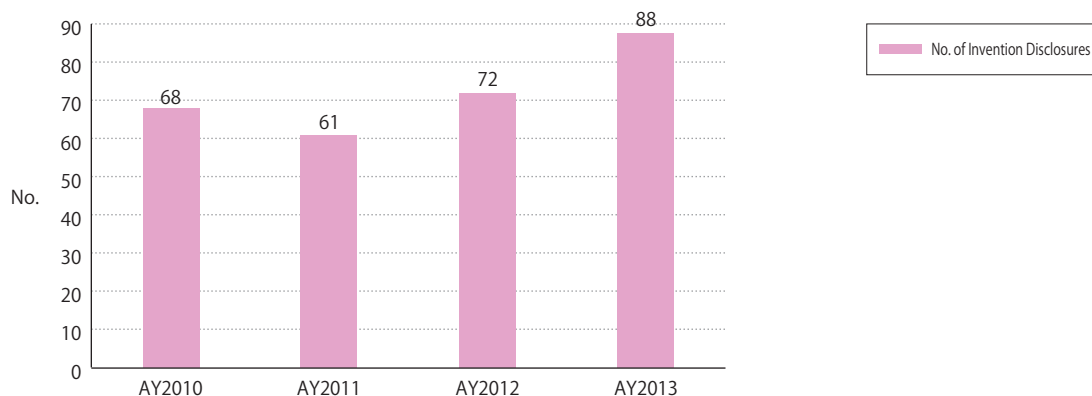
	AY2010	AY2011	AY2012	AY2013
No. of Applications	142	129	129	120
No. of Acceptances	22	24	30	22
Acceptance Rate	15%	19%	23%	18%

**Research Fellowships for Young Scientists:**

In view of the growing need to foster young researchers who will play an important role in future scientific research activities, JSPS provides a special program under which fellowships are granted to 1) young Japanese postdoctoral researchers who conduct research activities at Japanese universities or research institutions on a non-employment basis and to 2) graduate students who conduct research in Japanese university doctoral programs.

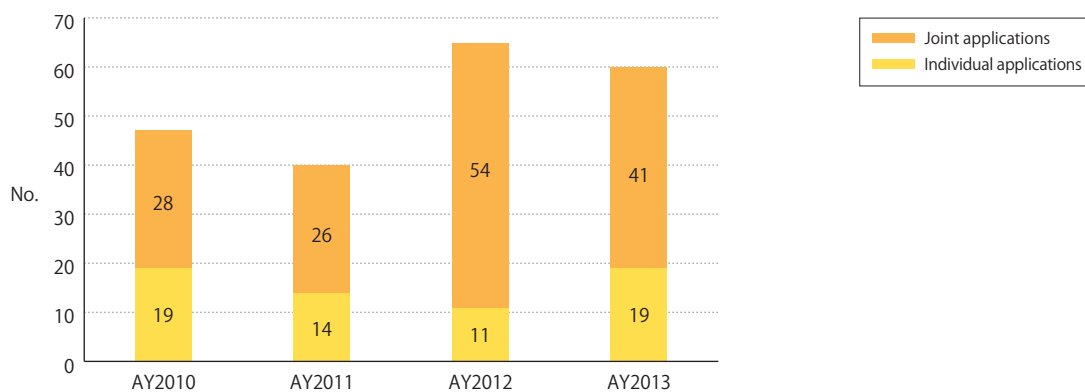
(10) No. of Invention Disclosures

	AY2010	AY2011	AY2012	AY2013
No. of Invention Disclosures	68	61	72	88



(11) No. of Domestic Patent Applications

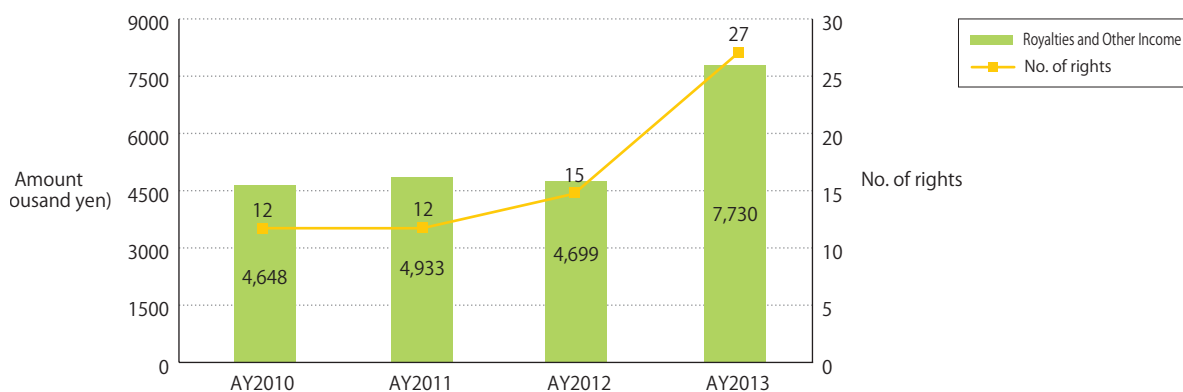
	AY2010	AY2011	AY2012	AY2013
Individual applications	19	14	11	19
Joint applications	28	26	54	41
Total	47	40	65	60



(12) Royalties and Other Income / No. of rights

(unit: thousand yen)

	AY2010	AY2011	AY2012	AY2013
Royalties and Other Income	4,648	4,933	4,699	7,730



Including patent, utility model right, design right, trademark right, copyright, plant breeder's rights, right of layout-designs of integrated circuit, know-how and materials.



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