



京都大学



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#### MESSAGE FROM THE PRESIDENT

# Promoting a Gender-Equal Research Environment

HE NUMBER and ratio of female scholars engaged in research at universities in Japan still remains remarkably low compared to many other countries. This highlights an area of Japan's academic environment and system in which there is still plenty of room for improvement. Despite this, however, it is also true that there are many female Japanese scientists who are internationally recognized as outstanding in their fields. It is all the more vital, therefore, to create an environment in which they can fully exercise their capabilities and flourish.

To this end, Kyoto University is focusing its efforts on developing a research environment in which all scholars can fully and freely pursue their research regardless of gender. As part of those efforts, we established our Center for Women Researchers (featured in this issue) and the Tachibana Award, an award acknowledging the achievements of outstanding female researchers at Kyoto University.

This year, in order to further enhance our efforts, Kyoto University has merged with the Center for Women Researchers and Gender Equality Promotion Office to form Office for the Promotion of Gender Equality (Gender Equality Promotion Center). To commemorate the establishment of this new organization, this special issue of Research Activities introduces several of the university's outstanding female researchers and their activities and achievements. It also highlights some of the university's initiatives to support female researchers. The scholars selected to appear in this brochure represent only a very small sampling our talented female research population, and we will continue to introduce yet further accomplishments by female researchers in subsequent issues.

In closing, I would like to express my sincere congratulations to the editor of this special issue, Prof. Kayo Inaba of our Graduate School of Biostudies, on her receipt of the internationally prestigious L'Oréal-UNESCO Award for Women in Science in recognition of her outstanding contributions to immunology research.

June 2014

Hiroshi Matsumoto President, Kyoto University



#### **ABOUT THE SPECIAL ISSUE**

## **Message to Our Readers**

An Aim of the Publication, Reflections on Supporting Women Researchers



Kayo Inaba Professor, Graduate School of Biostudies / Vice-President for Gender Equality / Director of the Gender Equality Promotion Center

S ONE OF THE LEADING RESEARCH-INTENSIVE UNIVERSITIES IN JAPAN, Kyoto University has achieved international recognition for its remarkable academic record. In addition to the Nobel Prize in Physiology or Medicine awarded to Professor Shinya Yamanaka in 2012, the University is renowned for garnering eight other Nobel Prizes, two Fields Medals, one Gauss Prize, four Lasker Awards, four Canada Gairdner International Awards, two Japan Prizes and four Kyoto Prizes. However, it is notable that all of these prizes have been awarded to male researchers.

Japan has a long tradition of excellence in the arts and literature, and there are many women who have achieved recognition for their skills and talent. Unfortunately, however, in terms of the number of women researchers in industry and academia, Japan ranks as the lowest among the Organisation for Economic Co-operation and Development (OECD) member nations. As a response to this situation, the Japanese government is addressing the need to increase the ratio of women researchers in the natural sciences as part of its Science and Technology Basic Plan. In order to achieve this target, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) is implementing a number of policies to promote the training, development and recruitment of women researchers. Kyoto University has also been active in addressing the gender gap, and established the Center for Women Researchers in 2006.

The Center offers a comprehensive support system to women researchers under the funding from Japan Science and Technology Agency (JST) for three years, so that their research activities need not be interrupted by childbirth or childcare. Upon completion of the term, Kyoto University implements its own services and policies to provide further support to women researchers across the natural sciences, humanities and social sciences, aiming to encourage those who will be able to contribute proactively not only to Kyoto University but also to the wider world, both nationally and internationally.



Statistical data regarding female students at undergraduate and graduate level and researchers at Kyoto University are outlined in the following paragraph — a quick glance shows that the current situation is not yet one we can be proud of. Nevertheless, among all of the distinguished researchers at Kyoto University, there are many female graduate students and young researchers who possess exceptional talent across many different fields. Every year, Kyoto University honors such excellence in research through the presentation of the Tachibana Award for the Most Outstanding Female Researcher.

As of 1 May 2013, the percentage of women researchers at assistant professor, associate professor and professor level reached 10.6% of all full-time researchers at Kyoto University — an increase of 0.7% year on year. Women constituted 15.3% of new recruits in the same period. If this recruitment ratio is maintained, undoubtedly the number of women researchers will steadily increase.

In light of these developments, this special issue of Research Activities focuses on active women researchers at Kyoto University, with the aim of informing a wide readership at universities and research institutes overseas about some of the research environments in which women researchers work at Kyoto University, as well as their various research activities.

We hope that our readers will enjoy this special issue, featuring an analysis of the current research climate for women researchers in Japan compared with that at Kyoto University, what women researchers think about older times at Kyoto University, as well as highlighting research conducted by Tachibana Award winner, frontline researchers and young professors, associate professors and assistant professors, offering a glimpse of their curiosity, enthusiasm and commitment to research.

### **AWARDS & HONORS**

# **International Recognition** of Kyoto University's Research

#### TOPIC

Professor Inaba receives the L'Oréal-UNESCO Award for Women in Science 2014



Professor Kayo Inaba at the Awarad Ceremony on 19 March 2014

Professor Kayo Inaba is one of the five Laureates of the L'Oréal-UNESCO Awards For Women in Science 2014, which were celebrated in Paris with events from 16<sup>th</sup> to 19<sup>th</sup> of March. The L'Oréal-UNESCO For Women in Science Awards, established by the world's largest cosmetics company L'Oréal and the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1998, aims to improve the status of women in science by recognizing outstanding research conducted by women researchers around the world. Since the establishment, the Awards have recognized women researchers, based on a long-term perspective, who have contributed to scientific progress. This year, Professor Kayo Inaba was awarded for her discoveries concerning the 'decisive role of dendritic cells in the immune system of healthy and diseased subjects'.

Although the history of vaccines can be traced back to the early 19<sup>th</sup> century, when the first successful vaccine for smallpox was developed, only recently have the mechanisms underlying immunological

responses begun to be uncovered. Professor Inaba is known for her work on demonstrating the importance of dendritic cells, which act as "sentinels"

Kayo Inaba completed her doctoral degree at Kyoto University's Graduate School of Science, and became the first female associate professor at Kyoto University in Faculty of Science. She was promoted to full professor in 1999. She became the University's first female Dean in 2003, and was appointed Director of the Center for Women Researchers in 2007, and Vice-President for Gender Equality in 2013. She was also a visiting professor at the Rockefeller University.



of the immune system. She has also shown that these cells can be treated outside the body, and then reinfuse into the body to stimulate immune responses. In addition, she developed a method to generate dendritic cells from bone marrow precursor cells — a key advance that could lead to a new type of anticancer treatment or open a new path for cellular therapy.

The three-day program of events in Paris included presentations of the Laureates' research at the French Academy of Sciences on March 18<sup>th</sup>, followed by a grand Award Ceremony at Sorbonne University on March 19<sup>th</sup>. In media interviews conducted in between the events, Professor Inaba was highly praised for her work on supporting and training women researchers.

Extensive coverage was achieved in the Japan media, and in international press including television and radio.

You can see a video that introduces Professor Inaba on YouTube, which produced by L'Oréal.



At the Charles de Gaulle International Airport in Paris, the Awards' poster of Inaba was displayed.

WEB www.loreal.com/Foundation/Article.aspx?topcode=Foundation\_AccessibleScience\_WomenExcellence\_U

#### HONORS

### Award Winning Researchers in Kyoto University

in Physics Hid	eki Yukawa (1949), Sin-Itiro Tomonaga (1965), Makoto Kobayashi (2008),
Tos	hihide Maskawa (2008)
in Chemistry	Kenichi Fukui (1981), Ryoji Noyori (2001)
in Physiology o	r Medicine Susumu Tonegawa (1987), Shinya Yamanaka (2012)
Heisuke Hiron	aka (1970), Shigefumi Mori (1990)
Kiyosi Itō (2006)	
Susumu Toneg	awa (1987), Yasutomi Nishizuka (1989), Yoshio Masui (1998),
Shinya Yamana	aka (2009)
Makoto Nagao	(2005), Masatoshi Takeichi (2005)
Chushiro Haya	shi (1995), Kiyosi Itō (1998), Shinya Yamanaka (2010), Masatoshi Nei (2013)
loffmann-Plakette 🔶	Shin-ichi Matsumoto (1965)
ey Memorial Medal 🔶	Junichiro Itani (1984)
ternational Award 🔶	Susumu Tonegawa (1983), Yasutomi Nishizuka (1988),
	Shinya Yamanaka (2009), Kazutoshi Mori (2009)
Elephant - 3 <sup>rd</sup> Class 🔶	Yoneo Ishii (1987)
s G. Harrison Prize 🔶	Tokindo S. Okada (1989)
Salem Prize 🔶	Mitsuhiro Shishikura (1992)
Robert Koch Prize 🔶	Shigekazu Nagata (1995), Shinya Yamanaka (2008), Tasuku Honjo (2012)
lical Science Prize 🔶	Shigetada Nakanishi (1996), Masatoshi Takeichi (2001), Koichi Tanaka (2002)
	Yoshinori Fujiyoshi (2005), Shimon Sakaguchi (2008), Kenji Kangawa (2009)
Nelson Cole Prize 🔶	Hiraku Nakazima (2003)
ohn Dawson Prize 🔶	Tetsuya Sato (2005)
′uri Gagarin Medal 🔶	Hiroshi Matsumoto (2006)
Booker Gold Medal 🔶	Hiroshi Matsumoto (2008)
The Ulysses Medal 🔶	Shuh Narumiya (2008)
S.B. Leakey Prize 🔶	Toshisada Nishida (2008)
ement de la langue érature françaises	Kazuyoshi Yoshikawa (2010)
de Gennes Prize 🔶	Susumu Kitagawa (2013)
	in Physics Hid Tos in Chemistry I in Physiology of Heisuke Hirons Kiyosi Itō (2006) Susumu Toneg Shinya Yaman Makoto Nagao Chushiro Haya Offmann-Plakette y Memorial Medal ternational Award Chushiro Haya Chushiro

INTRODUCTION

# **Women in University Research**

**Strengthening Japan's Research Capacity** 

### Women Researchers at a Glance : Japan

Source: Gender Equality Bureau, Cabinet Office, *White Paper on Gender Equality 2013* (WPGE), Ministry of Internal Affaire and Communication, *Stratistical* 

Topics, No. 80, 14 April 2014 (ST).



Investment in research and education is essential for the development of a knowledge-based society. Human resources are a key indicator for measuring competitiveness and economic development. In 2012, Japan's high school advancement rate stood at 96.8% for women and 96.2% for men, which suggests that a just a few more female students enter high school than male students. The university (undergraduate course) advancement rate stood at 55.6% for men and 45.8% for women, indicating that the rate for male students is 10% higher than that for female students. Since 9.8% of female students enter junior colleges, the women's total advancement rate for higher education was 55.6%. Despite decades of women's underrepresentation on campus, gender parity in terms of student enrolment was almost reached in 2005. Looking at the percentage of students entering graduate school immediately after completing their undergraduate studies, male students accounted for 15.4% and female students accounted for 6.2% in 2012 (WPGE, p.116).

The inclusion of women in science and academia has become a pressing issue in most industrialized countries. When compared to other OECD (Organisation for Economic Co-operation and Development) countries, the situation of female academics and scientists in Japan has often been described as being backward. As of 2013, there were 127,800 female and 759,200 male researchers in Japan. The percentage of women among all researchers in Japan has been gradually increasing, but still stands at 14.4%, whereas the corresponding rates in OECD countries are estimated to be two to three times higher than that of Japan (Figure 1).



Figure 1 Proportion of female researchers, 2013 (ST, p.6)

 WPGE:
 Gender Equality Bureau, Cabinet Office, White Paper on Gender Equality 2013

 WEB
 www.gender.go.jp/about\_danjo/whitepaper/index.html



ST: Ministry of Internal Affaire and Communication, Statistical Topics, No. 80, 14, April 2014
 WEB www.stat.go.jp/data/kagaku/kekka/topics/topics80.htm

SOURCES

Figure 2 suggests that 64.0% of the male researchers are in companies and 31.1% are in universities and research institutions. On the other hand, 61.7% of female researchers are in universities and research institutions.



Looking at the major fields of study for female researchers in universities and research institutes, they are concentrated in a limited range of fields, such as nursing, home economics and humanities. On the other hand, women accounted for only 9.2% of all researchers majoring in engineering and 13% of those majoring in sciences (Figure 3).



Even in major fields that have higher percentages of female researchers—the higher the position, from lecturers to associate professors and professors—the lower the proportion of females. Women account for approximately 50% of faculty members at junior colleges, but they account for 10% to 20% at universities. In particular, women still make up only a small percentage of professors in science, engineering, and agriculture (Figure 4).



Figure 4 Proportion of female faculty members in universities, 2012 (WPGE, p.119)

### Female Faculty Member with Tenure at Kyoto University

Source: Kyoto University Gender Equality Promotion Center Website
WED www.cwr.kyoto-u.ac.jp/english/



As of May 1, 2013, the total number of faculty member with tenure at Kyoto University was 2,777 (including seven assistants). Among them, female member account for 9.1 % (252 persons). It has increased 1.8% over the last seven years, up from 7.3% in 2006. The upward trend became obvious since 2000. Figure 5 shows the change in the number of female faculty member with tenure since 1952.



1) Although some data before 1951 remains, including statistics of school education conducted by the Ministry of Education since 1949, it is not reliable because some departments do not have full data and a total number of staff in the university was not provided. Therefore, data indicates that there were four women lecturers in 1952, the affiliation of three of them, except for one in the Faculty of Letters, are unknown. 2) Since 2007, Assistants were categorized into Assistant Professors and Assistants. In this figure, they are not differentiated. This is an updated version of the data initially compiled by Sono Yasuda (Newsletter No.2, Women Researchers Association of KU, 2005).

Figure 5 The change in the number and percentage of female faculty member with tenure in each position rank

#### **Japan's Government Policy**

**C** ONSIDERING the present percentage of women researchers in doctoral courses, the government will promote relevant activities so as to achieve the numerical target for recruitment of female researchers under the 3rd Basic Plan, i.e. 25% for natural science as a whole, and further raise the percentage to 30%. In particular, the government will aim at early achievement of the targets of 20% for physical science, 15% for engineering, and 30% for agriculture, and achievement the target of 30% for the total of medicine, dentistry, and pharmacy.

**T** HE GOVERNMENT will support universities and public research institutions that improve their research support system etc. so that female researchers may cope with childbirth, childcare and research. The government will expect universities and public research institutions to work on the establishment of flexible employment, personnel and assessment systems, as well as telecommuting and short-time working systems, and the improvement of their research support system, etc.

Looking at the male/female ratio in each rank, there are a lot fewer women in all categories because their total number is very small. Among them, the percentage of women at the rank of professor is extremely low, at only 5.9%. At the rank of associate professor, women account for 8.8%, and at the rank of assistant professor, 12.4% (Figure 6).



Figure 6 Distribution of male and female in each rank of positions, 2013

Among the departments with over thirty faculty members, the percentage of women is comparatively higher in the Graduate School of Education (33.3%), Graduate School of Law (18.8%), Institute for Research in Humanities (15.7%), and Graduate School of Letters (13.4%).

Regarding the statistics for graduate students, the percentage of women has been gradually rising. It is higher in the School of Medicine [Medical Science (56.0%)], Graduate School of Global Environmental Studies (53.7%), and Graduate School of Asian and African Area Studies (52.6%). It is comparably lower in the Graduate School of Energy Science (14.4%), Graduate School of Engineering (16.0%), and Graduate School of Informatics (18.8%). However, the figures are moderately higher than those for the undergraduate level in those fields<sup>\*</sup>.

(\*Source: Kyoto University ed., Kyoto Daigaku Gaiyo 2013, p. 23. WEB www.kyoto-u.ac.jp/ja/issue/ku\_profile)

To enhance research development and human resource development, the Japanese government and Kyoto University are engaged in various efforts to support the activities of female researchers (see Column).



Author: Noriko Inuzuka, PhD Professor, Gender Equality Promotion Center

N ORDER to achieve the foregoing targets, the government will expect universities and public research institutions to actively promote appointments by formulating specific plans for efforts to stimulate the activities of female researchers, achieve the numeric targets set for female researchers, and release data to the public regarding the percentage of enrolled women researchers categorized by job classification and department. The government will also expect them to make efforts to increase the number of female researchers in leading positions, the number of female students of natural science, and the number of quality women aiming to be professional researchers.

(Council for Science and Technology Policy, Japans' Science and Technology Basic Policy Report, 24 December 2010, p. 30)

#### **RESEARCH FRONTIERS**

# Cutting-Edge Research in Kyoto University

Kyoto University is known for the quality and diversity of its research. Each issue of Research Activities can only highlight a small selection of those endeavors, but we hope to convey an impression of the university's rich academic milieu.

### The Uterus Has Many Faces

The appearance of the uterus changes markedly depending on hormonal conditions and inherent contractility.



On MRI (magnetic resonance imaging), the uterus demonstrates distinct zonal differentiation, consisting of the high-signal endometrium, a distinct low intensity junctional zone, and the outer myometrium with an intermediate signal. However, its appearance markedly changes depending on hormonal conditions and inherent contractility. The eight images below were obtained from one subject during one menstrual cycle and during a period of contraceptive pill usage. The uterus indeed has many faces. The inherenet contractility of the uterus is supposed to be closely related to fertility problems, symptoms related to menstruation, endometriosis, and

related to menstruation, endometriosis, and other issues.

Kaori Togashi, MD, PhD Professor, Graduate School of Medicine www.med.kyoto-u.ac.jp/en/organization-staff/ research/doctoral\_course/r-043/



# Making the invisible visible

Single-molecule approaches to understand the function of individual protein molecules.

In the human body, various biological molecules are continuously in motion. Among these, protein molecules are especially important. How does a single protein molecule execute so many functions? Due to their size, it is very difficult to observe the functions of single protein molecules under



normal conditions. However, using various techniques such as single-molecule imaging (used for observing a single molecule of protein or a single DNA strand bound to a fluorescent dye or plastic microbeads), we can observe some functions directly. By unraveling the mechanisms of how protein molecules work step by step, we can deepen our understanding of fundamental biological activities.

#### Yoshie Harada, PhD

Professor, Institute for Integrated Cell-Material Sciences (WPI-iCeMS) www.harada.icems.kyoto-u.ac.jp/en/index.html

### Competences for Life

Evaluating them through performance assessments.



Performance assessment in physical therapy

In the past two decades, competences such as problem solving, critical thinking, and communication have come to be regarded as important educational goals, in addition to subject knowledge, from elementary to higher education in many countries. This indicates a concern not only with "what you know" but also with "what you can do." However, in order to observe competences it is necessary to make them visible in the form of performances and interpret them. My colleagues and I have been developing learning assessment

methods for competences in different disciplines from dentistry and physical therapy to philosophy.

Kayo Matsushita, PhD Professor, Center for the Promotion of Excellence in Higher Education



kaken.nii.ac.jp/d/r/30222300.en.html

### Living amid Differences

Minorities, gender, and connected coexistence.

Working on a long-term anthropological fieldwork project about hill-dwelling minorities in northern Thailand changed my perspective on life and scholarship. I have since been interested in the crisscrossing of differences such as ethnicity and gender, especially within the intimate aspects of life. My current project is "Care in Southeast Asia." In the region now faced with an aging population, where policies and institutional support are not yet sufficient, what kinds of grassroots activities and new social formations can be found, and what local concepts of care are there? The elucidation of these questions provides hints for solving our own problems. Fieldwork is a process of learning how to live by understanding how others live.

#### Yoko Hayami, PhD

Professor, Center for Southeast Asian Studies www.cseas.kyoto-u.ac.jp/en/2013/06/yoko\_hayami/ Karen family with the author (far right) in northern Thailand



### Were Edo-Period Japanese Internationally Minded?

The transition of Japan's recognition of the world during the late early-modern period.



The first Japanese map of Russia (late 18th century)

Id during the late early-modern period. I research how Japanese people's recognition of the world changed from the end of the 18<sup>th</sup> century to the beginning of the 19<sup>th</sup> century. My recent research has shown that during this transitional period, the Japanese began to see the world as divided into "Europe" and "everything else." I am

now getting closer to discovering the prototype that has been shaping the Japanese worldview since early-modern times.

Naoko Iwasaki, PhD Professor, Kyoto University Museum www.museum.kyoto-u.ac.jp/



### How to Find the Way to Divide

E The mechanisms for oriented cell division.

One strategy of organisms to maintain their homeostasis is replacing old cells with new ones without altering basic configurations of their bodies. Many types of stem cells contribute to the tissue metabolism by providing the tissues with fresh cells at the right time and the right place. The orientation of stem cell division is another management system to regulate tissue homeostasis. Oriented cell division



allows cells to divide symmetrically or asymmetrically by directing the spindle

axis parallel or perpendicularly, respectively, to the pre-determined axis. Our research aims to elucidate how the cells decide their division orientation in a given tissue.

**Fumiko Toyoshima, PhD** *Professor, Institute for Virus Research* www.virus.kyoto-u.ac.jp/Lab/Toyoshima-HP/EnHome.html

### Key to the Future

Palaeoclimatological studies using stalagmites and tree-rings in Asia.



A key to the future is to understand the past. My research subject is to reconstruct past climate variations by using oxygen/carbon isotopes and other geochemical proxies in geological archives such as stalagmites

and tree-rings. Particularly I focus on the ancient rainfall anomaly in Asia because the region is especially a densely populated region and might suffer from terrible weather disasters such as flood and drought. I would like to contribute to the precipitation prediction based on "Asian past rainfall information" that is provided by my study, even in a small way.

Yumiko Watanabe, PhD Assistant Professor, Graduate School of Science www.kueps.kyoto-u.ac.jp/~web-tecto/

### Seismometer

A magical tool to measure waves.

A seismometer is a sensor to measure seismic waves for determining the location and size of earthquakes. Today, we can determine these very fast (within a few seconds), so warnings of earthquakes can be sent to cell phones before the strong shaking arrives. Seismometers can also measure other kinds of waves. In February 2013, a meteorite fell in Russia producing a strong sonic boom, and the signal was recorded by seismometers. Shakings from huge landslides



are also measured by seismometers, and their size, speed, and direction are estimated. Extracting secret information hidden in seismic records is an interesting challenge for us.

#### Masumi Yamada, PhD

Assistant Professor, Disaster Prevention Research Institute www.eqh.dpri.kyoto-u.ac.jp/~masumi/index.htm



### Sustainable Livelihood Based on the Blessings of Satoyama

Assessing and planning local resource cycle systems in satoyama cultural landscapes.

Satoyama is a cradle of diversity that dwells in local nature and culture. The importance of satoyama landscapes providing habitats for rare species and conserving biodiversity is widely acknowledged, and the concept of "living in harmony with nature" has become essential in environmental studies. What, however, does "living in harmony with nature" actually mean? In the Laboratory of Landscape Ecology and Planning, we use interdisciplinary methods to

investigate satoyama-specific traditional resource cycling and risk avoidance techniques that can be revived today with a view to a sustainable society and effective risk management.

#### Katsue Fukamachi, PhD

Associate Professor, Graduate School of Global Environmental Studies www.ges.kyoto-u.ac.jp/cyp/modules/contents/index.php/shokai/faculty\_staff/fukamachi\_katsue.html?ml\_lang=en

### What Measures are Needed to Ensure Food Safety?

The social science perspective.



Food is a necessary nutritional source and it also brings a sense of enjoyment to life. Ensuring food safety is therefore of utmost importance for sustenance. While natural science research is clearly necessary in this regard, social science approaches are also essential. Without understanding the complexity of food systems and the behavior of food business operators, it would be impossible to consider and implement

measures. In addition, communication with consumers is another crucial aspect. In our laboratory, we conduct research into social systems for ensuring food safety (see the figure). I am particularly interested in cross-country comparative studies on food safety systems.

#### Haruyo Kudo, PhD

appropriate regulatory



Associate Professor, Food and Agriculture Safety and Ethics (Contributed Chair) www.foodsaet.kais.kyoto-u.ac.jp/index\_en.html

### What Does Water Do for Earthquakes?

Earthquake physics studied by seismic waves and numerical simulations.

Earth is a planet with water, which exists not only in the ocean but also inside the earth. As water can make rocks soft and weak, it is expected that water plays significant roles in the dynamics of the earth. However, these mechanisms have not been fully understood yet. My challenge is to clarify the role of water in earthquakes. Seismic

waves are a tool for my studies. My colleagues and I interpret observations by performing numerical simulations based on physics and results from rock experiments. We have found that slip evolution of a large earthquake could be governed by a water



distribution within a subducting plate.

Keiko Kuge, PhD Associate Professor, Graduate School of Science www-seis1.kugi.kyoto-u.ac.jp/



### **Gender and Politics**

An Emerging Field of Political Science.

How do politics and policies construct gender in a society, and how does gender affect politics and policies? These questions have become quite important in contemporary Japan where the rapidly aging population combined with low birthrates is suspected to impede the sustenance, let alone the growth, of the economy. A series of 'structural reforms' of the Japanese political economy since the 1990s did not only aim at transforming the production system, but also at restructuring the social reproduction system, including





family and gender relations. My current task is to uncover the structural and ideational transformations of Japanese

politics from the perspective of gender, and to elucidate how they are related to social changes.

Yuki Tsuji, PhD Associate Professor, Graduate School of Law kyouindb.iimc.kyoto-u.ac.jp/e/sD7bM

### The Surprising Eloquence of Everyday Garbage

Looking towards a sustainable society through a study of garbage.



The department where I belong to, has been carrying out a "household waste composition study" for roughly 35 years. We collect household waste, sift through it, and sort the contents into approximately 300 categories according to its material and usage. It is time-consuming and painstaking work; however, the result gives us a glimpse into the current "wasteful" (mottainai in Japanese) lifestyle and society. For example, we often find packages of food thrown out unopened and plastic shopping bags which have been used once and thrown away. We are pressing forward with their studies to find ways to reduce waste according to the 3Rs policy (reduce,

reuse, recycle), and to move toward a more advanced recycling society.

#### Misuzu Asari, PhD



Assistant Professor, Environment Preservation Research Center eprc.kyoto-u.ac.jp/ja/

# About the Cove



### The Kyoto University Clock Tower

The most recognizable structure of the Kyoto University campus, the Clock Tower was designed by Goichi Takeda, the university's first Professor of Architecture, and completed in 1925. With attention given to Secession-style design in all of its facets, the sonorous feel of the exterior makes for a building of immense historical significance.

### Origins of the Human Mind

#### Perspectives from Primatology and Developmental Psychology.

Studies on nonhuman primates are essential to gain a better understanding of the human mind. Comparative developmental studies tell us about how the human mind was formed during cognitive development and evolutionary history. Chimpanzees are the closest living relatives to humans and their developmental process can be examined in an identical test-setting to human infants. Face-to-face tasks using blocks and cups illuminated fundamental similarities as well as some differences between the cognitive development of the two species. Field observation of wild primates also sheds



light on the evolutionary origin of mother-infant bonds, social interaction with group members, and ecological adaptation to various environments.

#### Misato Hayashi, PhD

Assistant Professor, Primate Research Institute langint.pri.kyoto-u.ac.jp/ai/index.html



### How to Live in a City

🖥 Urban anthropological insights from Africa and Japan.



Majoring in urban anthropology, I have conducted fieldwork on the Bamiléké, a group which migrated to Yaoundé, the capital of Cameroon. Through my research, I have observed how the Bamiléké immigrants formed hometown associations to help one another and circulate money between the city and their hometowns. Currently, I am also studying the Rotating Savings and Credit Association (ROSCA) in Naha, Okinawa, called Moai, through which its members can deepen their friendships. From the associational lives of the Bamiléké in Yaoundé and Okinawans in Naha, my

colleagues and I can learn how to foster supportive relationships to enhance life in large cities.

#### Misa Hirano-Nomoto, PhD



Associate Professor, Graduate School of Asian and African Area Studies jambo.africa.kyoto-u.ac.jp/member/hirano.html

When I began studying at Kyoto University in early April 1999, I was astonished by the sheer number of undergraduates cycling on Higashi-ichido Street. I have never seen such a high density of cyclists anywhere in the world.... Somehow I felt then that part of the campus and the Clock Tower belong to these undergraduates — the real *Kyodai-sei* — and not to myself, having just joined from graduate school.

However, when I first saw a photograph of this scenery in my Hong Kong office, including the cherry blossom at the front and Hidari-Daimonji mountain at the back, I felt that I too used to belong there, and that now I can draw the Clock Tower.

Kiyoko Yamaguchi, PhD (Her profile is next page)



About



# **Do We Need Psychological Problems?** Researching belows for the second s

Researching kokoro from the perspective of clinical psychology.



During times of great disaster, the human psyche exhibits no psychological symptoms. The reality of the danger does not allow space for inner conflict. After the disaster, however, many psychological symptoms emerge. We found such phenomena in the care work for the Great East Japan Earthquake. Even when peace is attained in the outer world, we need some inner struggles to work with. Our psyche keeps some tasks in any circumstances to change

itself. Clinical psychologists research into the psychological problems and their transformation through the psychotherapy, which shows us the resilience and potential of our psyche.



Chihiro Hatanaka, PhD Uehiro Assistant Professor, Kokoro Research Center kokoro.kyoto-u.ac.jp/en/index.html

### **Make Biomass Value-Added Materials**

Studies of converting biomass into plastics as well as nanofiber.

Efforts to improve added value are being carried out in all materials. Such improvements can be made by changes in the material itself, or by using it in a form more excellent as the material. To convert biomass with an insoluble and infusible nature into biomass with solubility and fusibility is an example of the former method of improvement. Conversion of cellulose (existing in the largest quantity



as a biomass component) into nanofibers as a reinforcing material is an example of the latter method. My colleagues



and I are trying to impart plastic properties to biomass. We are also receiving a Japan Science and Technology Agency (JST) subsidy for our work seeking to improve the properties of lithium ion battery separator film by adding cellulose nanofibers.

#### Mariko Yoshioka, PhD Lecturer, Graduate School of Agriculture www.fukugou.kais.kyoto-u.ac.jp/frame\_indexe.htm



Kiyoko Yamaguchi was born in Shiga Prefecture, Japan, in 1976 and studied architectural design at UC Berkeley. After obtaining a PhD in Southeast Asian Area Studies from Kyoto University in 2005 and conducting her research on Philippine architectural history as a JSPS post-doctoral fellow, she taught at the History Department of The Chinese University of Hong Kong from 2006 to 2014. As her architectural drawing was selected for The Royal Watercolour Society 2014 Competition, she decided to change her career path and become an artist.

WEB www.history.cuhk.edu.hk/kyamaguchi.html

# Living with Natural Disasters

The effect of disasters depends on our preparedness in everyday life.



There are not many people who consider disasters to be their own problem. When a large-scale disaster occurs, every victim says "I never thought it would happen to me." The damage incurred depends on the degree of structural and social measures taken in preparation for disasters. My research examines how to save people's lives in a disaster and everyday preparedness for disaster survival. If

we understand the causes and circumstances of deaths from disasters and the measures we should take in everyday life, we can decrease not only the number of deaths, but also the difficulty of life after a disaster.

#### Maki Koyama, PhD

Associate Professor, Unit for Liveable Cities, Graduate School of Engineering/Medicine researchmap.jp/makik/?lang=english



### 🗄 Homo sum: Humani nil a me alienum puto

Epistemological philosophy questions human activities that give birth to" scientific knowledge."

I may be as curious and meddling as the ancient playwright Terence (190?-159 BC) who wrote "I am a human being: I regard nothing that concerns human beings as foreign to my interests." That is why I study epistemology, a branch of modern philosophy focusing on human knowledge. A French philosopher of the 20<sup>th</sup> century, Michel Foucault (1926-1984) once asserted that what philosophy should reveal today is that which is

visible but which people ignore, while science, on the other hand, should reveal what has previously been





invisible. So, what exactly do human beings see and know today?

Yuriko Tanaka Assistant Professor, Institute for Research in Humanities www.zinbun.kyoto-u.ac.jp/e/

### What is Mental Health in an Internationalized Society?

Scientifically investigating health and internationalization.

At the Sakagami Laboratory, Medical doctors and experts in international education gather at this laboratory to engage in research on health and internationalization from various perspectives. The stigma regarding mental health varies from country to country, and in our laboratory, my colleagues and I examine the personal and social stigmas associated with mental diseases in various regions of the world. My laboratory also conducts research on the health of students who are planning to go abroad. We investigate risk factors associated with health problems



that may arise while studying abroad. Also, working in cooperation with external medical institutions, my laboratory engages in research on occupational stress. Due to the rapid development of internationalization, occupational mental health-related

problems are expected to become even more complex and challenging in the future. At my laboratory, we hold a weekly meeting to discuss our research and share ideas. We strive to build on our research on a daily basis, with the sincere wish that our results may benefit society.

> Yu Sakagami, MD, PhD Associate Professor, The International Center kyouindb.iimc.kyoto-u.ac.jp/e/hL6xK



**Research Activities 2014** 

LOOKING BACK

# A Female Student in the Pioneer Days

A Life as a Researcher at Kyoto University



Mieko Kimura, PhD

With a PhD in Agriculture, Kimura's research field encompasses nutritional science, social preventive medicine, analytical chemistry and environmental medicine. Even after retiring from Kyoto University, Kimura has continued to be active in her research on disease prevention and micronutrients, and is now the President of Takeda Research Institute of Life Science, and a specially appointed professor at Kyoto Prefectural University of Medicine. She has published numerous research papers and books.

It was in 1946, just after the end of the war, that female students first enrolled at Kyoto University. In his speech at the enrollment ceremony, the President of Kyoto University affirmed his 'trust in female students' academic ability and personal quality', and stated that they would 'neither be discriminated against nor shown any favor'. There were only 17 female students out of 1,505 at that time, who faced great challenges as the University did not yet have a system in place for accepting them. Ten years later, the education system changed. Mieko Kimura, who has direct experience of being part of the new education system, now reflects on her days as both a student and a researcher.

### — As you graduated in 1957, you were a member of the 10<sup>th</sup> generation of the University. How many other female students were there?

**Kimura:** There were 43 female students in the whole University. When I checked with the record-keeper, I learned that there were 21 female students in the Faculty of Literature, eight in Pharmaceutical Sciences, four in Agriculture, three in Medicine, two in Law, two in Education, one in Economics, one in Engineering, and one in Science. At that time, Dr. Shizue Yanagishima (who graduated from the Faculty of Science, Biology and was the first female student at Kyoto University), and Dr. Kayo Ootsuka (who graduated from the Faculty of Science, Mathematics) were Associate professors of the College of Liberal Arts and Science.

#### — Were male and female students treated differently?

**Kimura:** In terms of the system, no. Actually, some laboratories refused to accept female students when the time came to choose a laboratory for graduate research. However, many of the professors did take care of us, and I had the opportunity to study under the supervision of Professor Yotaro Tsukamoto (1912-2005, Horticulture). He assigned me the research subject of plant hormone physiology, in particular clarifying the mechanism of the dormant and flowering stages of Gladiolus.

#### — Did you already want to become a researcher at that time?

Kimura: No, not at all. I just kept working on what I could do and what I loved to do, and as a result, I remained a researcher. The theme of my doctoral dissertation was: 'Studies of Occurrence and Distribution of Monoamines in Horticultural Crops'. I studied at Stanford University with my husband

<sup>\*1</sup> Kimura's research involves studying the mechanisms of micronutrients (vitamin and mineral) for disease prevention, and the development of methods of ultramicroanalysis. She has succeeded in developing an animal model for ischemia, bone dysbolism and gout, which was registered in the National BioResource Project in 2012 (NBRP Rat No:0626, Strain name: MKO/Tami). It is a rare rat model for lifestyle disease developed in Japan. Kimura has also led a project to produce drinking water from deep ocean water to prevent cardiovascular disease, and has led the development of an online nutrition administration system (http://www.health-info.jp/nutrition/calc/). She has also contributed to the victory of Kyoto University's American Football Club through nutritional guidance.

and two-year-old daughter during the doctoral course. After returning to Japan, a professor at the Faculty of Medicine invited me to his division and I began a histochemical study on the neurochemical transmitter serotonin and catecholamine in plants, as a junior assistant. After that Motonori Fujiwara (Professor of Hygienics) appointed me as an assistant, and since then my research area has expanded to nutritional science, preventive medicine, and social medicine<sup>\*1</sup>.

#### — Were there many women researchers at the time you were appointed to the Faculty of Medicine?

**Kimura:** No, compared to today, there were far fewer women professors. The Kyoto University women professors' gathering<sup>\*2</sup> started as an informal tea party with three or four people in 1981, when Professor Yanagishima and Professor Otsuka of the Faculty of Liberal Arts, as I previously mentioned, asked me to join them.



Many people, including my supervisors, professors from other faculties, colleagues, and students supported me a great deal throughout my research carrer. In addition, I undertook collaborative research with many researchers nationally and internationally. I stayed in Thailand and China for a couple of weeks for my research on epidemiology and presented my work at international academic conferences. I appreciate the support of many people, and my husband, whose research field is completely different from mine, and my daughters. I rarely felt any inconvenience being a woman researcher. Even when I did have a few things that were on my mind, there is no use worrying about them as I can put aside trivial things. Overall, while raising my two daughters, I have been able to enjoy my work and family life to the full.

#### — Do you think that the research environment and support system for women researchers now has improved compared with that during your student days at Kyoto University?

**Kimura:** Yes, I think so. In the past, many women researchers remained single, but nowadays it is not unusual to balance research and child-raising. I expect there will be more favorable research environments for the next generation, by the time our grandchildren grow up, and I hope that younger generations of women try to realize this goal rather than just wait for things to happen.

I think the gender gap issue will still remain in the university setting as long as the term "women researchers" exists. Both male and female researchers are researchers.

Keeping in mind the memorable words of Kyoto University President Risaburo Torigai at the time of the first female student enrollment in 1946 — "I trust in female students' academic ability and personal quality, and they will neither be discriminated against nor will be shown any favor" — I hope that we keep advancing as researchers towards a brighter future.

#### Thank you very much for today.

#### WEB www.health-info.jp/kimura/kimuramieko.html

Kimura and peers at the 50 Year Reunion of the graduate class of 1957.

\*2 The Kyoto University women professors' gathering is a voluntary, independent organization, which aims to: 1) Deepen friendship and promote exchange among women researchers at Kyoto University, 2) Promote information exchange about issues of common concern, 3) Raise the profile of women researchers and eliminate discrimination, and support various other activities. Informal discussion sessions with the President of Kyoto University began in the year following the establishment of the organization; these sessions have since become an annual event. The organization was renamed as the 'Women Professors' Group Meeting' in 2006, which hosts seminars in various fields, holds an annual meeting to address common issues and publishes a newsletter, with the goal of providing an informal forum for information exchange (http://kyotoufemale.web.fc2.com/index.html).

### ENCOURAGE WOMEN TO RESEARCH

# The Tachibana Award

For Most Outstanding Female Researchers



The Tachibana Award Ceremony was held on 3 March 2014. Each recipient received an award certificate and plaque from Hiroshi Matsumoto, the president of Kyoto University, as well as an extra prize from Hironobu Yasuhara, the president of the Wacoal Corporation. Following the ceremony, the awardees, Katayama and Wang gave the presentations on their research.

The Tachibana Award for the Most Outstanding Female Researcher was established in 2008 to acknowledge the excellent research achievements of young female researchers at Kyoto University. By publicly honoring young female researchers for their outstanding work in the humanities, social sciences, and natural sciences, the Tachibana Award aims to further motivate not only the awardees themselves, but also other young female researchers following in their footsteps, thereby helping cultivate accomplished female researchers who will lead the future of academic research at Kyoto University and in Japan as a whole.

#### Eligibility (Academic Year 2013)

Candidates must be Kyoto University postgraduate students or researchers (whose job descriptions include academic research, including postdoctoral researchers and JSPS fellows) of female gender, aged 39 or below, with outstanding research achievements. The age limit can be extended to include candidates aged 42 years or below for candidates who had difficulty in securing time for research due to child birth, child care, or care for an elderly or sick family member.

- **Student Division:** Candidates must be enrolled in a doctoral course at Kyoto University at the end of the academic year in which the award is presented. (Those on temporary leave are not eligible.)
- **Researcher Division:** Candidates must hold a doctoral degree or have proven academic research ability equivalent or superior to that of a doctorate holder.

#### Awarding

One awardee selected from each division will receive a certificate and extra prizes (a commemorative gift and \$100,000). An incentive award may be presented to an appropriate candidate.

#### Selection and Announcement of Results

A selection committee established within Kyoto University will examine application documents in the first screening. Short-listed candidates will be invited to an interview in the second screening. Awardees will be selected based on the results of the interview.

#### Award Ceremony

The award ceremony will be usually held on 3 March<sup>\*</sup>. After the award ceremony, the awardees will be asked to deliver lectures about the research themes for which they received the Tachibana Award. Awardees will be provided with further details of the award ceremony in advance.

\*The day of the Doll Festival, which is a traditional Japanese event to pray for young girls' growth and happiness.

#### 2014 TACHIBANA AWARD LAUREATE : STUDENT

### **Towards Green Photonics**

Material design of rare-earth-ion-doped wavelength converters and elucidation of luminescence mechanisms.

"Green photonics" is a technology of light which contributes to a sustainable environment. In order to improve the photovoltaic efficiency of crystalline Si solar cells, we designed rare-earth-doped glasses as wavelength converters to modify the solar spectrum by characteristic electric energy levels of rare-earth ions. These materials have the potential to show the quantum cutting (QC) phenomenon converting one blue photon into two near-infrared photons. In glass materials, we firstly reported the QC evidence in experiments. By heat treatment of the glass, an enhanced conversion efficiency was obtained by controlling



its atomic-level structure. My work can create valuable luminescent materials based on scientific knowledge!

Yumiko Katayama, PhD

JSPS postdoctoral fellow, Graduate School of Human and Environmental Studies www.talab.h.kyoto-u.ac.jp/

2014 TACHIBANA AWARD LAUREATE : STAFF



### Chinese Diaspora in Asia and the Search for a New Paradigm of Multi-Diversified Co-existence



Chinese Muslims gather around a mosque for 'īd al-fiţr ritual, Yunnanese Chinese Mosque, Chiang Mai. Jan.1999

My main theme of research focuses on the processes by which Yunnanese Muslim migrants intermittently crossed the border to Thailand from the end of the 19<sup>th</sup> century to the end of the 20<sup>th</sup> century, based on oral history studies and long-term fieldwork.

This research has led to the elucidation of how Yunnanese migrants established a network based on Islamic identity and fostered ethnic coexistence with those seeking to integrate in Chinese-language spheres such as China and Taiwan. The research offers, from a transnational perspective, a regional model suitable for multicultural coexistence

required for the 21<sup>st</sup> century in order to meet today's rapidly advancing globalization, namely: a realworld understanding of migrants; a conceptual study of the region which enables coexistence with others; and a new framework for mutual respect and understanding between migrants and nations.



Wang Liulan, PhD Associate Professor, The Hakubi Center for Advanced Research www.cias.kyoto-u.ac.jp/en/staff/wang.html

#### 2014 HONORABLE MENTION AWARD : STUDENTS

### Social Learning Mechanisms in Early Infancy

The power of human gaze in infant learning.

Infants need to extract useful information from a distractive world. They can efficiently do so by learning from others (social learning). I examine the importance of social learning in early infancy, experimentally showing that preverbal infants learn specifically from human agents. Infants learn about objects in their environment from human gaze rather than nonhuman agents (robots). In addition, I have demonstrated that this specific learning from humans



is based on referential expectations from human gaze. Thus, infants may have a powerful learning mechanism that enables efficient learning from humans.

#### Yuko Okumura

PhD Candidate, Graduate School of Letters www.bun.kyoto-u.ac.jp/~sitakura/index-j.html



2014 HONORABLE MENTION AWARD : STAFF

### **Mutualism or Bargain?**

Relationships between plants and their pollen couriers.



In pollination, plants and animals exchange nectar and pollen delivery, thus it is considered as a win-win business. As found in trades in human society, does the trade between plants and animals depend on the supply-demand balance? Are there buyers' and sellers' markets in pollination? Analyzing theoretical models and worldwide datasets, my collaborators

and I found a geographical gradient in the pollination supply. It also indicates that plants in the tropics have showy and splendid flowers and attract unusual and costly pollen couriers such as birds and bats, because pollination supply is severely limited.

#### Shoko Sakai, PhD

Associate Professor, Center for Ecological Research www.ecology.kyoto-u.ac.jp/~sakai/index E.html



#### 2013 TACHIBANA AWARD LAUREATE : STUDENT

### A New Non-Invasive Method for the Diagnosis of Breast Cancer

Establishment of a new diffusion MR imaging method for the diagnosis and management of breast cancer.

Breast cancer is the most prevalent cancer among women worldwide. However, current imaging approaches (such as mammography) often do not provide enough information for proper lesion management, which sometimes results in unnecessary invasive treatments. My colleagues and I, under the supervision of Denis Le Bihan who has introduced

the concept of diffusion MRI, have succeeded in identifying patients presenting low-risk lesions (ductal carcinoma in situ) with very high specificity, precluding the necessity for invasive treatments. Diffusion MRI is a new, non-invasive diagnostic approach to evaluating tumor types

> and their perfusion, and a step toward "tailor-made" oncology treatment.

(a) Conventional postcontrast MRI image (b) Perfusion map (c) Diffusion map. The malignant nature of the lesion is established based on the high perfusion fraction area (b, white arrow) associated with low water diffusion (c)

#### Mami Iima, MD, PhD



PhD Candidate, Graduate School of Medicine (at the time) www.kuhp.kyoto-u.ac.jp/~diag\_rad/

2013 TACHIBANA AWARD LAUREATE : STAFF

### **Cis-Acting Transcriptional Repression Establishes a Sharp Boundary in Chordate Embryos**

The function of the bone morphogenetic protein (BMP) signalling system in dorso-ventral (DV) patterning of animal embryos is widely conserved among Bilateria. In vertebrates, the BMP ligand Admp is expressed dorsally and moves to the opposite side to specify the ventral fate. Associate Professor Yutaka Satou and I showed that Pinhead is an antagonist specific for Admp with an essential role in establishing the sharp boundary of the ascidian epidermis

along the DV-axis. Pinhead and Admp exist in tandem in the genomes of a wide range of animals. This genomic configuration is important for mutually exclusive expression of these two functionally opposed genes through cis-acting transcriptional repression. Our data suggest

that this dual negative regulatory mechanism is widely conserved in a wide range of animals.

Kaoru Satou-Imai, PhD Research Fellow of the Japan Society for the Promotion of Science (RPD) ghost.zool.kyoto-u.ac.jp/ Pinhead Pinhead Pinhead

Models of chromosome conformations of the Pinhead and Admp genomic region when Pinhead transcription is active (left) and inactive (right).

2012 TACHIBANA AWARD LAUREATE : STUDENT

### **Quantum Invariants of Knots**

A wonderful encounter of low-dimensional topology and mathematical physics.



Knot theory, which is a branch of topology, aims to understand the structure of knotted strings in space. Knot theory made great strides in the 1980s, with the discovery of quantum invariants. Quantum invariants originate not only in topology but also in mathematical physics related to quantum mechanics. I am trying to understand quantum invariants in the language of topology, with a view to new

innovations. Incidentally, the knot in the picture is my favorite; it has a nice property in which every pair of two strands is not knotted. Can you see that?

Sakie Suzuki, PhD Assistant Professor, The Hakubi Center for Advanced Research www.kurims.kyoto-u.ac.jp/~sakie

2012 TACHIBANA AWARD LAUREATE : STAFF

### **Plant Volatiles as Information Tool**

Ecological interaction networks triggered by plant volatiles.

When plants get damaged, they release volatiles. These volatiles are called Induced Plant Volatiles. I have been studying how and to what extent induced plant volatiles affect biological communities. I have found that induced plant volatiles affect 1) distributions of both herbivore insects and predator insects, 2) diurnal and nocturnal behaviours of some insects, and 3) communication between plants.



According to this research, I suggest that induced plant volatiles are important in creating and maintaining biological diversity.

#### Kaori Shiojiri, PhD

Assistant Professor, The Hakubi Center for Advanced Research www.hakubi.kyoto-u.ac.jp/eng/02\_mem/h22/shiojiri.html



Food web in supported by two layers which interacts among living things through induced plant volatiles.

#### 2011 TACHIBANA AWARD LAUREATE : STUDENT

### Pushing laser beams to the diffraction limits

Fine-tuning laser beam shape and polarization to achieve a needle-like focus.

Laser beams have led to the development of various advanced technological fields, such as optical data storage, lithography, and laser microscopy, due to their excellent focusing characteristics. A beam, however, cannot create a spot size smaller than its wavelength; this is popularly known as Abbe's diffraction limit. Therefore, many laser applications have attempted to change the color of lasers (wavelength) from red to blue (shorter wavelength). I have been pushing the envelope in my designs for the polarization and shape of laser beams. By engineering photonic-crystal lasers,



I have demonstrated their needle-like focus characteristics, which may lead to the further development of various fields in optics.

#### Kyoko Kitamura, PhD

Assistant Professor, The Hakubi Center for Advanced Research www.hakubi.kyoto-u.ac.jp/eng/02\_mem/h24/kitamura.html



Focusing properties of photonic crystal ring-cavity laser (wavelength =0.98 µm). Experimental results for radially polarized halo-shaped beam (a) and results for radially polarized doughnut shaped beam(b).

2011 TACHIBANA AWARD LAUREATE : STAFF

### **Discovery of Thymic Cells Ensuring T-cell Self-Tolerance**

Identification of specific cells educating T-lymphocytes about discrimination between immunological self and non-self in thymic tissues.



Immunology influences many aspects of our life. Recovery from influenza, vaccines, pollen allergy, and graft rejection – all of these involve immunology. The most important part of the immune system is to distinguish between self and non-self, which enables foreign pathogens to be attacked, but not our healthy cells. My research focuses on how the immune system acquires this ability. The thymus is an organ for generating T-cells, which are major

players in immune responses. I identified specific cells (teachers) which instruct T-cells (students) about "what is self?" within the thymus (classroom) for sending educated T-cells out into our body (society). Thus, my research is anticipated to contribute to human health.



Yoko Hamazaki, PhD Associate Professor, Graduate School of Medicine kyouindb.iimc.kyoto-u.ac.jp/e/mK8yN

#### 2010 TACHIBANA AWARD LAUREATE : STUDENT

### A New Vision of Solar Sunspots

Investigating the mechanism of magneto-convection through a detailed observation of small structures inside sunspots.

Have you ever seen a sunspot? Sunspots are dark regions on the solar surface with a low temperature and strong magnetic field. I had imagined that such solar phenomena were already well investigated; however that was not the case. A high spatial resolution telescope called the Hinode Satellite was launched into space in 2006, and it captured unexpected images of sunspots. I looked into the details of the small bright structures



inside sunspots called "umbral dots," including their kinetic and magnetic properties. The umbral dots showed manifestations of magneto-convection, and so this study can provide experimental proof of the complicated physics of magneto-convection.



Hiroko Watanabe, PhD PhD Candidate, Kwasan and Hida Observatories (at the time) www.kwasan.kyoto-u.ac.jp/~watanabe/

#### 2010 TACHIBANA AWARD LAUREATE : STAFF

### **Business Groups**

#### Diversified Big Business in Emerging Economies.

The Japanese zaibatsu, the Korean chaebol, the grupos economicos in Latin America and the family holdings in Turkey are all examples of large, diversified, and often family-controlled organizations that are collectively referred to as "business groups." Such forms of big business are especially common in emerging economies, and many business groups have shown remarkable resilience, adjusting to economic and political turbulence, international competition, and technological change. My research provides a systematic and balanced understanding of the nature, characteristics, and welfare effects of business groups from theoretical, empirical, and internationally comparative perspectives. I assert that, under certain



conditions, business groups can be resilient and contribute to national economic growth.

#### Asli M. Colpan, PhD

Associate Professor, Graduate School of Management and The Hakubi Center for Advanced Research www.aslicolpan.com



"The Oxford Handbook of Business Groups," A.M. Colpan, T. Hikino and J. R. Lincoln eds., Oxford University Press, Oxford (2010)

2009 TACHIBANA AWARD LAUREATE : STUDENT

### Molecular mechanisms of lifespan regulation

#### Sakiko Honjou, PhD

PhD Candidate, Graduate School of Biostudies (at the time)

2009 TACHIBANA AWARD LAUREATE : STAFF

### Unstable Nuclei studied with Antisymmetrized Molecular Dynamics Yos

Yoshiko Enyo, PhD

Professor, Yukawa Institute for Theoretical Theoretical Physics

### What is TACHIBANA? Origins of the Name

The tachibana tree, which produces small blossoms in summer and inedible citrus fruits in winter, is very well known in Japan. In the country's oldest historical record, *the Kojiki*, the tree is called *tokijikunomi*, which means "ever-fragrant fruit," and it was respected as a symbol of vitality. Likewise, it is featured in sixty-six verses of *the Manyōshū*, Japan's oldest poetry anthology, making it one of the collection's most

frequently referred-to plants. In those verses its evergreen quality is used as a metaphor for eternal life and prosperity. In the Heian period, the tachibana tree was used, together with the cherry tree as an auspicious symbol, and the two trees were planted outside important buildings such as the Kyoto Imperial Palace. The tachibana blossom was also used as the basis for the five-leafed design of the Japanese Order of Culture medal. Originally, a design based on the cherry blossom was proposed for the medal, but the Emperor Showa requested that the tachibana be used instead. The Emperor explained that "falling cherry blossoms have meaning, but culture should be everlasting," and so the flower of the perpetually green tachibana tree was adopted to symbolize the permanence of culture. In that tradition, Kyoto University chose to name its award for outstanding young female researchers after the tachibana tree, to express the hope that the work of the awardees will continue to flourish.



**BRIEF HISTORY** 

# **Ten Years of Gender Equality at KU**

Chronological table of the Gender Equality Promotion Center

The Basic Law for a Gender-Equal Society was enacted on 23 June 1999. The Japanese government has been promoting efforts to realize a gender-equal society, based on the contents of the law and the Basic Plan for Gender Equality (formulated in 2000, and revised in 2005 and 2010). Following the national initiatives, Kyoto University has been enhancing programs for gender equality, especially focusing on supporting female researchers. The Gender Equality Center (the former Center for Women Researchers) aims to assist all of the constituency of Kyoto University and build global networks as a hub for promoting gender equality.

#### A Decade of Promoting Gender Equality at Kyoto University

Jul.	2005	A project team to study the framework of gender equality was created.
Oct.	2005	A study report "Framework of Gender Equality in Kyoto University" was released by the project team.
Oct.	2005	The Committee of Promotion for Gender Equality was established.
Mar.	2006	Basic Philosophy and Principles for Gender Equality were formulated.
Jul.	2006	"Supporting Activities for Female Researchers" (competitive funding) was commissioned by the JST (Japan Science and Technology Agency) Special Coordination Funds for Promoting Science and Technology.
Sep.	2006	The Center for Women Researchers was established.
Feb.	2007	The Nursery Room for Sick Children "KOMOMO" was opened.
Feb.	2007	Round Table Forum for Female High School Students was established.
Mar.	2007	A Survey on Gender Equality was released by the Committee of Promotion for Gender Equality.
Jan.	2008	The Gender Equality Promotion Office was established (by reorganizing the Committee

of Promotion for Gender Equality.)



Opening Ceremony of the Center for Women Researchers



Opening Ceremony of Nursery Room for Sick Children



Certification for the namer of "KOMOMO'

- Jul. 2008 Global COE Program for Reconstruction of the Intimate and Public Spheres in 21<sup>st</sup> Century Asia (a collaborative relation with the Center for Women Researchers) was launched.
- **Sep. 2008** The 1<sup>st</sup> Tachibana Award for Most Outstanding Female Researchers and Graduate Students was presented.
- Mar. 2009 Action Plan for Gender Equality (a five-year plan) was formulated.
- Jul. 2009 "Supporting Positive Activities for Female Researchers" (competitive funding) was commissioned by the JST Special Coordination Funds for Promoting Science and Technology.
- **Oct. 2010** The 4<sup>th</sup> Joint Symposium of Support Activities for Female Researchers was held at Kyoto University.
- **Nov. 2011** Tachibana Award was assented by Wacoal Corporation.
- Apr. 2014 The Gender Equality Center was established (by reorganizing the Gender Equality Promotion Office and the Center for Women Researchers.)
- Jul. 2014 New building for Gender Equality Promotion Center is completed.

WEB www.cwr.kyoto-u.ac.jp/index.php



Classical Binding and Box for Certificate of Tachibana Award



4<sup>th</sup> Joint symposium of Support Activities for Female Researchers in Kyoto University



Round Table Forum for Female High School Students

### Enhancement of Work-Life Balance : KURUMIN Mark Accreditation

Kyoto University was granted the next generation accreditation mark "KURUMIN" by the Kyoto Labor Bureau in 2009. This logo indicates that the university has been acknowledged as a general business owner that has continued to meet the accreditation standard of work-life balance based on the Act on Advancement of Measures to Support Raising Next-Generation Children (enacted in 2003). One of the programs for faculty and staff member is the Hart Barren Hart

Support for Babysitter Users. The university issues babysitting discount tickets to offset part of the expenses borne by eligible members who use commercially available home child-care services (for infants under 12 months of age up to the third year of elementary school, and for children up to the sixth year of elementary school who require care for health reasons).



#### **PROGRAMS AND SERVICES**

### Gender Equality Promotion Center Supporting for Network, Outreach, Public Relation, Child Care, Nursing Care, and Work-Life Balance

Under the initiative of the president of Kyoto University, the Center for Women Researchers was established in September 2006 to provide an environment in which female researchers can fully exercise their abilities, and to promote the development of excellent young researchers. The center has promoted various activities through four programs, to develop and improve the research/ education environment for female researchers so that they can continue their research work and cultivate their successors. To enhance gender equality, some programs have been open to all members of Kyoto University.

Together with the Gender Equality Promotion Office and in cooperation with the local community, the center has worked toward the realization of a gender-equal society. In 2014, the Center for Women Researchers and the Gender Equality Promotion Office were integrated into the Gender Equality Promotion Center to develop the activities.

The center's facilities are available for small meetings or temporary child care during study meetings, etc. Books on gender equality and work donated by female faculty members are also available for lending.





Four Programs of the Center

### Welcomed Asian Female Leaders

The National Women's Education Center conducts a participatory seminar on pressing issues pertaining to women's capacity building for administrative officers responsible for women's policy and education and NGO leaders in the Asia Pacific region. The 2013 Seminar was held in Tokyo and Kyoto and nine female leaders from Cambodia, Mongolia, Philippines, Thailand, and Vietnam took part in the course. On 1 October



2013, the participants visited the Center for Women Researchers. They took a lively interest in the center's infant care room and "Green Curtain Project" (see a column on p. 20).

### Networking, Outreach Project, and Public Relation

The center provides information to support students and staff of Kyoto University, highlighting gender mainstreaming, diversity, work-life balance, career development, and networking. It also offers lectures, seminars, and other events focusing on international academic and scientific careers.

#### Lectures Relating to Gender Equality

In cooperation with faculty members in related fields, the center offers a course titled "Gender Studies" and a pocket seminar titled "Gender and Science" to undergraduate students in their first semester.

#### Symposium for Diversity and Equity in Research Institutions

The center hosts various symposia, study meetings, and training programs related to gender equality and career development of researchers.



Symposium Series: "My Work and Career Design'

#### Roundtable Forum for High School Students : "Talking with Researchers at Kyoto University"

Through exchanges with faculty members and students at Kyoto University, this forum gives high school girls an opportunity to learn about what researchers do. To enable young participants to discover more about college-level studies and researches, postgraduate orientation and careers as researchers and scientists, faculty members serve together with undergraduate students as lecturers and instructors on the theme of "Getting to Know Kyoto University, Talking with Researchers."

### Support for Child Care and Nursing Care

#### Infant Care Room for Infants Awaiting Public Day Care

The center offers a Day Care Room for Infants on Waiting Lists for Public Nursery School to help female researchers and students to pursue their research and educational goals while raising their children. The management is commissioned by a private corporation, and the university covers a portion of the cost for the care.

#### Child Pick-up & Care Service

The center coordinates a service program to pick up children at regular day care or after-school care, when their parents are unable to do so, and temporarily provides care at the center's facility.

#### Lectures and Networking Events

The center hosts various lectures and networking events related to nursing care, such as lectures on senile dementia and amyotrophic lateral sclerosis. It also provides a course "Assertiveness Training and Stress Management Seminar" aimed at building better relationships in research institutions.





### Nursery Room for Sick Children "KOMOMO"

The Nursery Room for Sick Children, commonly called "KOMOMO," is a day care facility that provides care for sick or convalescent children when they cannot attend their regular day-care facility, kindergarten or elementary school. This facility is staffed by nurses and childcare workers, and provides appropriate care for sick children in collaboration with Kyoto University Hospital. All the students and faculty/staff members at Kyoto University are eligible for the service.



### Support for Work-life Balance

The center provides financial support for researchers to hire research/experiment assistants while they are away from work on maternity leave, for child-raising or family care, and so have difficulty securing time for their research. Applications for this system are accepted twice a year (in June and December.)

The data of Figure 1 indicates a large percentage of beneficiaries in the medical field. Among the reasons for application, child-care accounts for 90%. These 90% are women, though the proportion of male users has been increasing (Figure 2).





Figure 1 Research Area of Users



### Green Curtain is also Promoted!

The center responded to a call for green wall sponsors issued by the Kyoto University Environment Preservation Research Center, in the framework of its "Green Curtain Project – for a cool and environmentally friendly summer." As a green wall sponsor, the center grows *goya* (bitter melon) in window boxes. Their endeavor has been featured on the Green Project website as part of a blog promoting the growth of *goya* plants.

(Kyoto University Environment Preservation Research Center)



#### SUMMARY OF KYOTO UNIVERSITY

### **Overview: University Profile**

Mission The mission of Kyoto University is to sustain and develop its historical commitment to academic freedom and to pursue harmonious coexistence within the human and ecological community on this planet.

Foundation

Kyoto University was originally founded as Kyoto Imperial University on the June 18, 1897. It was the second imperial university to be established in Japan.

Students Undergraduate students: 13,580 (as of 1 May 2014) Master's course students: 4.794 Professional course students: 721 Doctoral course students: 3.645

Faculty members: 2,836

Non-teaching staff members: 2,657

**Faculty and Staff** (as of 1 May 2014)

> **Facilities and** Environment

Faculties: 10 Graduate Schools: 18 Research Institutes: 14 (as of 1 April 2013) Intra-University Networks and Organizations: 6 Education and Research Centers: 17 Overseas Offices and Facilities: 49 (as of 1 May 2014)



### By the Numbers

JPY 174,807 million	FY2013 revenues
20.2%	Percent of funding from external sources in the revenues
JPY 169,271 million	FY2013 expenses
42.0%	Percent of instruction and research costs, the largest portion of the expenses
1,779	International students (as of 1 May 2014)
2,507	Students studying abroad (FY2013)
275	International faculty members (as of 1 May 2014)
851	International researchers hosted annually (FY 2013)
281,948	Academic paper citations
	(total from 2007-2011. From InCites <sup>™</sup> , Thomson Reuters)

### **KU Key Words**

#### Freedom and Autonomy

Kyoto University values **freedom and autonomy** in research that conforms to high ethical standards, and believes in promoting a disciplinarily diverse spectrum of research, while also pursuing an integrated, multidisciplinary approach.

#### Self-Reliance and Self-Respect

The principles of **self-reliance** and **self-respect** are key elements in Kyoto University's academic approach. Guided by those concepts, students and researches are encouraged to be bold, independent, and creative in their study and research.

#### 2× by 2020 🔶

2× by 2020 (Double by Twenty-Twenty) is the slogan of Kyoto University's new international strategy, by means of which the university aims to double its international indices in research, education, and international service by the year 2020.

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Map and Access

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