Kyoto University

Research Activities

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Special Feature:

Promoting "Interesting" Research with International Institutions and Industries

An interview with Kyoto University's new president, Dr. Juichi Yamagiwa and Exective Vice-President Nagahiro Minato

京都大学

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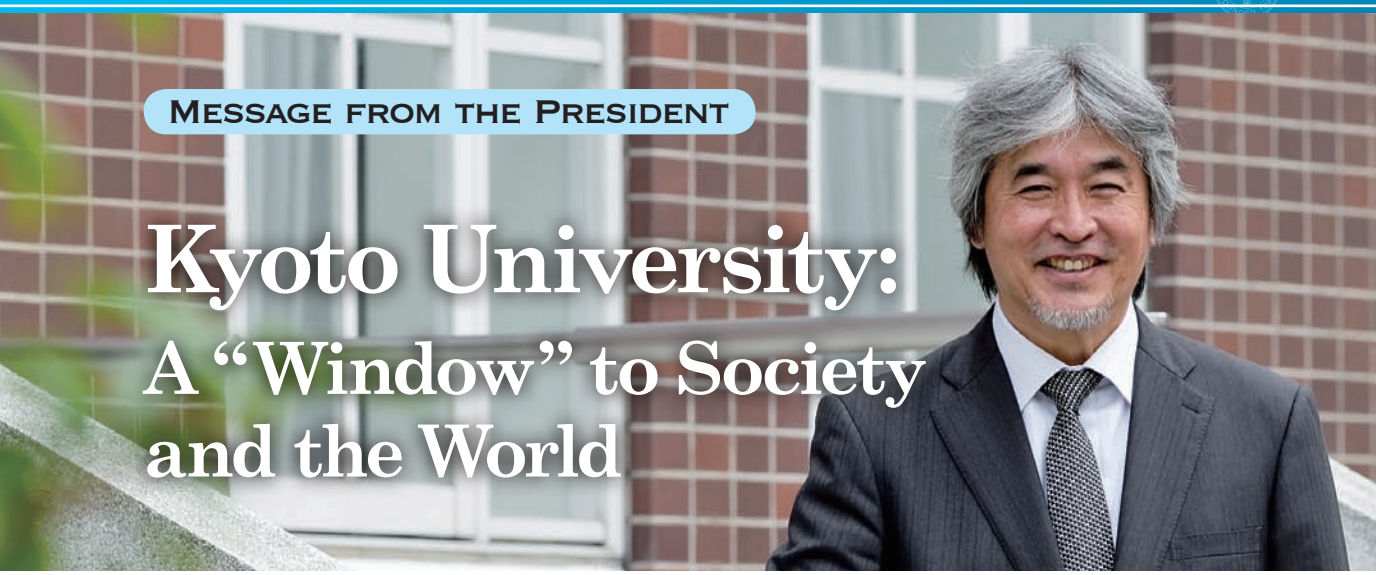
Sonjo-do ➡ p. 23



Message from the President

Kyoto University: A "Window" to Society and the World

IN OCTOBER of this year I was honored to be appointed as the 26th president of Kyoto University.

Kyoto University was established in 1897 as Japan's second imperial university. Located in Kyoto, which is widely regarded as the nation's cultural heartland, the university has sought to provide its scholars with a rich academic environment centered on free thinking and frank dialogue. Since its foundation, the university has preserved a distinctive academic philosophy of self-reliance and self-respect, and emphasized that students must take responsibility for their own academic advancement. These ideas continue to inspire Kyoto University scholars to this day, as they blaze new trails of knowledge and discovery. Those robust ideals, coupled with the imagination and determination of our students and researchers have enabled us to consistently produce outstanding graduates, including several Nobel laureates and other international awardees, who are able to contribute to the betterment of our world.

Recent years have seen rapid changes in the domestic and international situation for Japan's universities. In these rather turbulent times, we must seriously consider the role that universities are required to play. What form should Kyoto University take in thirty years from now? What about a hundred years from now? I believe that Kyoto University must strive to be a place where academic endeavor can proceed undisturbed, and that it should maintain a slight form of detachment from general society in order to be unconstrained by convention, but that it must also provide its scholars with a connection—a "window"—to society and the world at large.

Kyoto University's tradition of encouraging uninhibited dialogue and cooperation among its scholars and students has nurtured a fertile ground for the development of groundbreaking multidisciplinary fields of study and research. This, in turn, has paved the way for innovation and discovery. Through this vibrant environment, the university aims to cultivate students who can question commonly-held ideas and beliefs in order to push through and surpass our current level of knowledge. We then encourage them to take their knowledge and skills into the international community, where they can fulfill their potential and contribute to the world as a whole. In this respect, our relationships with our international partners around the world are of the utmost importance. Through our connections with our international partners, our scholars are able to combine the fresh perspective and knowledge of new encounters and collaborations with the accumulated wisdom of their peers and predecessors at Kyoto University.

This edition of *Research Activities* also seeks to serve as a "window"—a window through which the distinctive and cutting-edge work of our scholars may be viewed by people around the world. I hope that you will be infected by our enthusiasm for interesting and creative ideas, and perhaps even inspired to join us, and participate in some way.

December 2014

Juichi Yamagiwa
President, Kyoto University

SPECIAL INTERVIEW

Promoting "Interesting" Research with International Institutions and Industries

A Vision for Kyoto University's Research Promotion Policy

In October 2014, Kyoto University came under the leadership of a new president, Dr. Juichi Yamagiwa, and a new team of executive staff. The new executive line-up will bring fresh ideas and approaches to Kyoto University's research and education activities. In this interview, President Yamagiwa is joined by Prof. Nagahiro Minato, executive vice-president for research, planning, and hospital administration, to discuss their plans and vision for the university's future.

(Photographs by Dr. Stefan Gruber, Associate Professor, The Hakubi Center for Advanced Research)

— Before we discuss your concrete plans to promote the university's research, please share your thoughts about the particular characteristics and strengths of Kyoto University's research activities. *(Editor)*

Yamagiwa: I think the primary characteristic of our research activities is "originality." In addition to work by our scholars which has long been acknowledged around the world, such as the primatology studies of Dr. Kinji Imanishi[1] and the philosophy of Dr. Kitaro Nishida,[2] Kyoto University continues to foster a diverse range of internationally acclaimed research in fields such as iPS cell research,[3] which is led by Dr. Shinya Yamanaka, the director of our Center for iPS Cell Research and Application (CiRA), and also in areas of regenerative medicine.

Minato: Originality is certainly a characteristic of our research that we can be proud of in the international academic community, along with the actual achievements of our researchers. Kyoto University is a mid-sized institution by international standards. However, our research activities are remarkably diverse for its size. I would also say that "diversity" is a distinctive quality of Kyoto University's research.

Yamagiwa: I agree, and such diversity is reflected in the fact that we have the largest number of research institutes and centers of any university in Japan,[4] and in general those facilities have always been established at the request of our research communities. When our researchers have forged into new frontiers of knowledge, the university has supported them in developing a new field of study, rather than try to confine them in an existing area.

In addition, the university has historically maintained an environment that encourages free thinking, and has allowed researchers to pursue

1) For more information about Kinji Imanishi and Kyoto University's heritage of fieldwork and primatology please see *Research Activities,* **3**(4), 4–6 (2013). 2) For more information about Kitaro Nishida and the Kyoto School of philosophy, please see *Research Activities,* **3**(4), 4–6 (2013). 3) For more information about the Nobel Prize-winning work of Dr. Shinya Yamanaka and the Center for iPS Cell Research and Application (CiRA), please see *Research Activities,* **3**(1), 6 (2013).


Executive Vice-President
Nagahiro Minato


President
Juichi Yamagiwa

ideas which at fist may even seem absurd, or which cannot be expected to produce quick results. Such an environment enables researchers to faithfully pursue their own interests, and can lead to new discoveries. This approach is doubtlessly one of the reasons that Kyoto University has produced so many of Japan's Nobel laureates.[5)]

Minato: Kyoto University has a longstanding tradition of academic freedom, of valuing and supporting the diverse curiosity of its researchers. It also has as an institutional agility and flexibility which enables it to integrate new academic knowledge at any time, as testified by our many research institutes and centers. It's impossible to imagine what new discoveries and innovations might be waiting in the future.

— Bearing in mind the academic culture that you have just described, could you tell us about the university's current policies and plans for research promotion?

Yamagiwa: Japanese universities are currently undergoing a period of transition. Interaction through dialogue is becoming an increasingly important factor in both human resource development and academic research. Through our "pocket seminars" and other hands-on experiences, Kyoto University is providing students with opportunities to learn on-site at the very frontline of research. In 2013, our Institute for Liberal Arts and Sciences was established to systematically enhance our liberal arts and science programs. Through a combination of robustly structured

4) Kyoto University has produced five Nobel Prize laureates in Physics, two in Chemistry, and two in Physiology or Medicine. Profiles of the laureates and information about their achievements can be found in "*LAUREATES: Award-Winning Scholars at Kyoto University*" (2014). 5) As of 1 October 2014, Kyoto University has fourteen research institutes and seventeen research centers. 6) The slogan of Kyoto University's recently formulated international strategy, by means of which

fundamental education and rich experience-based education, we aim to provide students with clear paths for advancement in their chosen fields of study. We are now focused on pursuing this kind of multi-dimensional approach to clearly guiding our students in their education.

Based on our international strategy *The 2x by 2020 Initiative*,[6] and utilizing our overseas liaison offices, we seek—through exchange programs, double and joint degree programs with international partners, and internship programs with global companies—to cultivate individuals of talent and ability who will provide leadership to the global community.

Minato: By strategically establishing overseas liaison offices,[7] we expect to dramatically accelerate our industry-academia collaboration engagements with international companies. We are now looking into the establishment of a support mechanism for research collaboration with domestic and international industries, and various ways in which the yet-to-be-exploited results of fundamental research can be used to genuinely benefit society. We also want to put more effort into creating a place to foster interdisciplinary collaboration, where researchers from different disciplines can meet, and where unforeseen cross-fertilization can be allowed to give birth to new knowledge and breakthroughs. We hope to enhance our system to support such developments.

'To put it very simply, the university is committed to "interesting" research. That orientation will never change.'

——— *Yamagiwa*

'It's impossible to imagine what new discoveries and innovations might be waiting in the future.'

——— *Minato*

Yamagiwa: I anticipate that our International Center for Scientific Innovation (provisional name) will be such a place. The facility is currently in the process of construction, but as of the next fiscal year, the offices of various different companies will be established within it, and it is anticipated to provide academic and industrial researchers with an environment in which they can easily and freely share information and knowledge. It will also provide students with opportunities to experience industrial research through internship programs.

Minato: At present, there are several facilities on campus where academic and industrial researchers are engaged in research collaboration. However, the establishment of a dedicated venue where researchers can meet across the boundaries between academia and industry, and share not only information, but also their ideas and vision, will be vital for academic progress in the future.

Industry-academia collaboration in Japan tends to be heavily focused on exit strategies. What is really important, however, is to understand that the best products can only be derived from the best science. Without truly excellent scholarship, we cannot produce truly excellent outcomes. Kyoto University is expected

the university aims to double its international indices in research, education, and international service by the year 2020.
7) Not including the overseas offices of individual faculties and departments, Kyoto University currently has liaison offices in London (UK), Heidelberg (Germany), and Bangkok (Thailand).

Juichi Yamagiwa, PhD, President. Graduated from Kyoto University's Faculty of Science in 1975. Primary research interests: anthropology and primatology.

Nagahiro Minato, MD, PhD, Executive Vice-President for Research, Planning, and Hospital Administration. Graduated from Kyoto University's Faculty of Medicine in 1975. Primary research interests: immunology, cell biology, medicine.

to make significant contributions to society by producing truly innovative research results. To meet those expectations, the university must excel in advanced fundamental research, and it must also cover a broad range of basic research areas.

Yamagiwa: Since its foundation, Kyoto University has been committed to creative research based on a philosophy of academic freedom and a creative spirit. To put it very simply, the university is committed to "interesting" research. That orientation will never change. Such "interesting research" has the power to capture people's attention and imagination, so that they can share in the experience. In the past, the influence of such research would often be limited—to an individual researcher or a few specialists in a narrow field, or perhaps it would be unknown outside of Japan. But now, as an international academic institution, we aim to share our distinctive research with the world. We will continue to expand and develop our collaboration with academic and industrial partners throughout the world, and ensure that the results of our research are applied for the betterment of human society and the planet as a whole. I hope that all of our readers will keep a close eye on Kyoto University, and join us in moving forward with our "interesting research!"

— Thank you very much for sharing your plans and ideas with us as we embark on this new phase for Kyoto University.

HISTORY

Founder of Modern Wheat Genetics

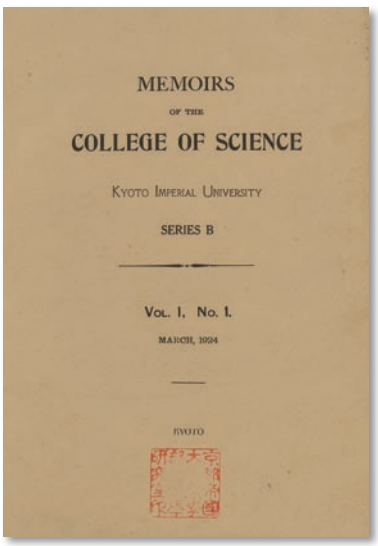
The Legacy of Professor Hitoshi Kihara

Dr. Hitoshi Kihara, professor emeritus of Kyoto University was born in Tokyo in 1893, and spent his undergraduate and graduate years in Sapporo, Hokkaido. He often said that he was raised in the wilderness near the Ishikari River. This upbringing seems to have given him a sturdy naturalist's spirit, which influenced his whole life.

IN 1920, when Kihara was a graduate student at Hokkaido Imperial University, Professor Kan Kōriba of the College of Science of Kyoto Imperial University (the former name of Kyoto University) appointed him as one of his assistants. Four years later, Kihara submitted a doctoral dissertation to the College of Science, and received his science doctorate in 1924. In the same year, his dissertation was published in the Memoirs of Kyoto Imperial University's College of Science (*Series B*, **1**, 1–200). The article established a basis for genome analysis, and Kihara was proud to have it published as a lead article in the first volume of the college memoirs. It was to become one of his top three most widely cited scientific publications.

Prior to the Kihara's work in 1924, Sakamura (1918) determined the chromosome numbers of eight different wheat (*Triticum*) species, finding 2n (somatic chromosome number) =14 for one species, 2n=28 for four species and 2n=42 for three species. Those findings led Sakamura to discover polyploidy in wheat, with the basic chromosome number (x) of seven; the diploid species being $2n=2x=14$, tetraploids $2n=4x=28$ and hexaploids $2n=6x=42$.

In 1918, following on from Sakamura's work, Kihara analyzed the meiotic chromosome behaviors of $3x$ hybrids obtained by $2x \times 4x$ wheat and $5x$ hybrids obtained by $4x \times 6x$ wheat. In his 1924 dissertation, Kihara reported their chromosome pairings: 7 bivalents + 7 univalents in the $3x$, and 14 bivalents + 7 univalents in the $5x$ hybrids. Those results led him to conclude


MEMOIRS
OF THE
COLLEGE OF SCIENCE
KYOTO IMPERIAL UNIVERSITY
SERIES B
VOL. I, NO. 1.
MARCH, 1924
KYOTO


MEMOIRS OF THE COLLEGE OF SCIENCE, KYOTO IMPERIAL UNIVERSITY, SERIES B, VOL. I, ARTICLE 1.

Cytologische und genetische Studien bei wichtigen Getreidearten mit besonderer Rücksicht auf das Verhalten der Chromosomen und die Sterilität in den Bastarden.

Von

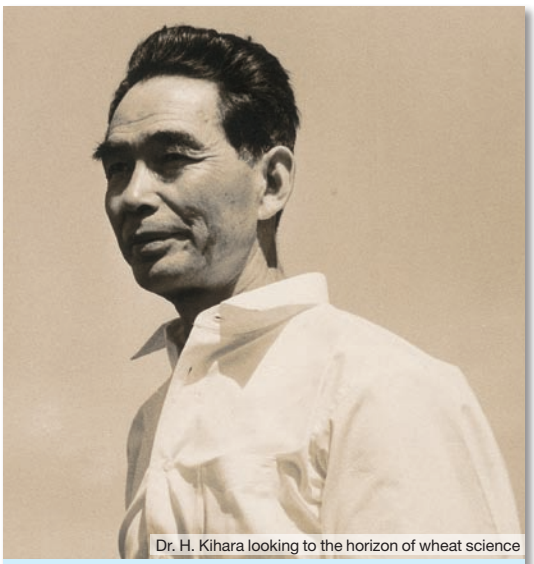
HITOSHI KIHARA.

Mit 5 Tafeln und 117 Textfiguren.

Inhaltsverzeichnis.

Front cover of *The Memoirs of the College of Science, Kyoto Imperial University, Series B*, **1**(1), 1924, and the first page of Dr. Kihara's article, which appeared on pp.1–200.

that $2x$ and $4x$ wheat have one set of seven chromosomes in common and the second set of $4x$ wheat is unique, and that the $4x$ and $6x$ wheat have two chromosome sets in common and the third set of $6x$ wheat is different from the former two. From those conclusions, Kihara considered the set of seven chromosomes as a genetic unit of inheritance, and gave it the name "genome" (Kihara 1930). He designated the genome formulae, AA, AABB, and AABBDD, to the diploid (= einkorn), tetraploid (= emmer) and hexaploid (= common) wheat, respectively. Kihara and Lilienfeld (1934) later discovered a new $4x$ species, to which they designated the genome constitution AAGG: the completion of genome analysis of the *Triticum* genus. Kihara's school then extended genome analysis to several other gramineous genera, such as *Aegilops* (F. A. Lilienfeld, S. Matsumura, M. Tanaka), *Avena* (I. Nishiyama), and *Echinochloa* (T. Yabuno) (the main workers are indicated in parentheses).



Dr. H. Kihara looking to the horizon of wheat science

Hitoshi Kihara (1893 - 1986) was a geneticist served as a professor at the Faculty of Agriculture, Kyoto University from 1927 to 1956. He was elected a member of the Japan Academy. He noticed that in wheat seven chromosomes form a basic unit of the inheritance and function, and thus named it genome. The concept of genome formed the basis for development of biology and genetic engineering.

The genome analysis of wheat revealed that its A genome originated from $2x$ wheat (Kihara 1924). The origin of the second genome, B, is still in debate, although several studies indicate *Aegilops speltoides* as the probable donor of this genome.

Genome analysis of the genus *Aegilops* revealed that a $4x$ species, *Ae. cylindrica*, has a CCDD genome constitution, and a $2x$ species, *Ae. caudata*, has a CC genome (Kihara and Matsumura 1941). Kihara thought the following two equations should hold true for the main characteristics of emmer and common wheat and for *Ae. caudata* and *Ae. cylindrica*:

(i) [Common wheat (AABBDD)] – [Emmer wheat (AABB)] = [D-genome donor]

(ii) [*Ae. cylindrica* (CCDD)] – [*Ae. caudata* (CC)] = [D-genome donor]

If the results of the two equations were the same, the characteristics derived from them should be the characteristics of the D-genome donor. Kihara observed seven characters of all four species, finding that the characteristics suggested by the two equations coincided with each other on six characters as follows: the number of 2n chromosomes is 14, there are spike breaks in the umbrella type, the empty glume is awnless with flat top edge, the outer glume of the lateral spikelet has a short awn, and the empty glume does not have keel. He searched for his *Aegilops* collection, and found that *Ae. squarrosa* possessed all of those characteristics. He submitted a full-sized article to report those results to a Japanese journal, but it was not published due to the difficult economic situation at the end of World War II. Instead, a manuscript of two printed pages in Japanese was published in 1944 in a Japanese journal called *Agriculture and Horticulture*. The article was titled "Discovery of the DD-analyser, one of the ancestors of *Triticum vulgare*." It was to become the most frequently cited of all his written works.

In 1955, after the end of World War II, Kyoto University organized its first full-scale overseas expedition called the Kyoto University Scientific Expedition to the Karakoram and Hindukush

Members of the Kihara School celebrate his 50th year of wheat research. Dr. Kihara invited the students to the Nishiatami Hotel on 22 November 1968. He named the gathering the *Triticum* 50 Celebration (in Chinese characters: 採而来50祝賀会).

(KUSE). Kihara led the expedition, which comprised two teams: the Hindukush team, headed by Kihara, and the Karakoram team, headed by Kinji Imanishi〔For more information: *Research Activities*, **3**(4), 4-6〕. The two teams comprised twelve members, one reporter, and two photographers in all. They left from Tokyo Airport on 14 May 1955, and returned on 3 September. Kihara's main mission was to complete a field survey of the Fertile Crescent and its neighboring regions, where common wheat was assumed to have originated. The results of this expedition were published in eight volumes, the first of which was titled *Cultivated Plants and their Relatives*. The volume's nineteen chapters dealt with fourteen types of cultivated plant, covering twenty-one genera and thirty-four species in all. Later, the members of KUSE and their coworkers in Kihara's and related schools at Kyoto University became widely recognized as specialists in economic plants. This group of specialists included K. Yamashita, S. Nakao, M. Tanaka, S. Sakamoto, N. Yamamoto and K. Fukui, and the Faculty of Agriculture came to be known as "the Faculty of Expeditions."

◆

In the early 1950s, Kihara's main interest shifted to interaction between the genome and plasmon (cytoplasmic genome). He developed a method of studying this problem called "nucleus substitution," a process which involved repeated backcrosses of the hybrid between the plasmon donor as the female and the genome donor as the recurrent pollen parent. The method was based on their different transmission modes: biparental transmission of the genome and maternal transmission of the plasmon. Kihara transferred the *Ae. caudata* plasmon to common wheat using this method. The alloplasmic wheat thus produced expressed pollen sterility, leading to the discovery of the first case of cytoplasmic male sterility in wheat (Kihara 1951). This article describing this process, titled "Substitution of the nucleus and its effects on genome manifestation" became one of Kihara's three most frequently cited articles, launching the new field of hybrid wheat breeding.

Kihara's school extended plasmon analysis to most species of the *Triticum-Aegilops* complex. Plasmons were introduced to a dozen of the representative types of wheat, and were classified by their effects on wheat phenotypes and the molecular differences in their organellar DNAs (Fukasawa 1953; Tsunewaki *et al.* 1996, 2002), along with complete sequencing of the chloroplast and mitochondrial DNAs of common wheat (Ogihara *et al.* 2002, 2005). In combination, Kihara's genome analysis and Tsunewaki and his colleagues' plasmon analysis established the maternal and paternal lineages of all *Triticum-Aegilops* species.

◆

Kihara is one of the discoverers of the sex chromosome in plants, finding it in *Rumex acetosa* (Kihara and Ono 1925). Later, he bred seedless autotriploid watermelon, and in 1952 was honored with the Award of the American Society for Horticultural Science. In 1953, Kihara served as vice-president of the 9th International Genetics Congress in Bellagio, Italy. He was elected chairman of the 1st International Wheat

Dr. Kihara's 1946 dictum
English version (left) and original (right)

Genetics Symposium, held in Winnipeg, Canada in 1958. He delivered the symposium's opening address, and in its closing session, he left a deep impression on the assembled scholars with a lecture incorporating color films of KUSE.

Kihara's school would later produce leading geneticists in the fields of molecular and population genetics, including H. Ozeki, T. Yura, and N. Sueoka in molecular genetics, and K. Kojima, M. Nei, T. Ohta, and T. Mukai in population genetics.

◆

Kihara was an enthusiastic sportsman who enjoyed playing baseball, tennis, and particularly skiing. The first book he wrote was about skiing—a volume coauthored by K. Endo that was published in 1919. He was the first Japanese official to attend the International Ski Tournament held in Finland, attending the 9th tournament in 1926, during which Japan was formally approved as a member of the International Ski Federation. He served as the leader of the Japanese ski team in two Winter Olympic Games: the 8th, held in Squaw Valley, USA, and the 9th, held in Innsbruck, France. He was also active in the field of nature conservation. From May 1955 to March 1969, while he was director of the National Institute of Genetics in Mishima, Shizuoka, he was engaged in efforts to conserve the natural flora of entire area of Nishikidani Valley. The valley is the water source of the Kanogawa River, which was used to irrigate the Tagata Plain in Shizuoka Prefecture.

◆

Kihara's originality is clearly evidenced by the quantity of his works involving pioneering first achievements and discoveries. He was a man who constantly spoke about his future plans—always looking forward. He did not preach his philosophy to his students, nor direct them towards their future. Nevertheless, they were greatly influenced through their dialogues with his Kihara, and the pride that they took in being his students, was evident when they formed a group known as "Kihara's School."

The following dictum of Kihara is well known among biologists in Japan and around the world to this day:

> *The History of the Earth is recorded in the Layers of its Crust; The History of all Organisms is inscribed in the Chromosomes.*
>
> ***Hitoshi Kihara, 1946***

Author:
Koichiro Tsunewaki, PhD
Professor Emeritus of Kyoto University, Member of Japan Academy

Acknowledgements Dr. Kihara's writings, including *Wheat—Records of a Biologist* (written in Japanese), Chuokoronsha, Tokyo, 1951, and *Wheat Studies—Retrospect and Prospects*, Elsevier Scientific Publishing Co., Amsterdam, 1982, were referred to in writing this article. The information generously provided by Miss Y. Kihara is also gratefully acknowledged.

AWARDS & HONORS

International Recognition of Kyoto University's Research

TOPIC

Kyoto University Alumnus Awarded Nobel Prize in Physics

Prof. Isamu Akasaki, a graduate of Kyoto University's Faculty of Science; professor of Nagoya University; professor of Meijo University, has been jointly awarded the 2014 Noble Prize in Physics. The prize motivation is "for the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources." The prize was jointly awarded to Prof. Akasaki together with Prof. Hiroshi Amano of Nagoya University, Japan and Prof. Shuji Nakamura of the University of California, Santa Barbara, USA.

Prof. Isamu Akasaki

Prof. Akasaki became interested in Kyoto University after hearing from a graduate of his high school who enrolled Kyoto University about the atmosphere of its laboratories, its culture of encouraging creativity, and its prominent researchers.[1)] After enrollment, he studied analytical chemistry under Prof. Masayoshi Ishibashi. As his student life progressed, he began to feel a desire to do or create something new, no matter how small. This aspiration, together with a level of dedication and persistence seldom found in other researchers, led to his groundbreaking discovery of gallium nitride (GaN).[2)]

WEB 1) www.jsap.or.jp/apsp/oralhistory/QOBU070808.pdf, 2) www.youtube.com/watch?v=g6kTiyNMXc4

TOPIC

Two Professors Receive the Medal of Honor with Purple Ribbon


Prof. Ikuko Hara-Nishimura


Prof. Susumu Noda

In November 2014 the Government of Japan announced the awarding of two Kyoto University researchers with the Medal of Honor with Purple Ribbon (*Shiju Hōshō*). This award is conferred by the Emperor of Japan for meritorious deeds, or for excellence in the fields of science, art, or sport, including in scientific discovery and invention.

The two awardees are Prof. Ikuko Hara-Nishimura of the Graduate School of Science, awarded for her research on plant molecular cell biology, and Prof. Susumu Noda of the Graduate School of Engineering, for his research on quantum optoelectonics.

*Please refer to the following link for more information on Kyoto University researchers who have been awarded the Medal of Honor with Purple Ribbon: WEB www.kyoto-u.ac.jp/ja/profile/intro/honor/award_b/purple_ribbon

Topic

Professor Kazutoshi Mori Shares Lasker Award

Prof. Kazutoshi Mori of the Graduate School of Science was awarded the Albert Lasker Basic Medical Research Award by the Albert and Mary Lasker Foundation on 8 September 2014. Prof. Mori and Prof. Peter Walter of the University of California, San Francisco, shared the award for their discoveries concerning the unfolded protein response (UPR). Prof. Mori is the seventh Japanese Lasker laureate, following Dr. Shinya Yamanaka, director of Kyoto University's Center for iPS Cell Research and Application (CiRA) and winner of the 2012 Nobel Prize in Physiology or Medicine.

Since the inception of the Lasker Award in 1945, there have been seven Japanese recipients, five of whom are Kyoto University alumni and/or faculty members. In addition to Prof. Mori (2014) and Dr. Yamanaka (2009), the award has also been conferred on Profs. Yoshio Masui (1998), Yasutomi Nishizuka (1989), and Susumu Tonegawa (1987).

Profs. Mori (left) and Walter

From the Editor In recognition of their UPR discoveries, Profs. Mori and Walter were also jointly awarded the Shaw Prize in Life Science and Medicine in 2014 and, together with Dr. Yamanaka, the Canada Gairdner International Award in 2009.

WEB www.kyoto-u.ac.jp/en/about/events_news/department/rigaku/news/2014/140919_1.html
WEB www.upr.biophys.kyoto-u.ac.jp/en/ (Mori's Lab)

Topic

Professor Tetsuro Matsuzawa Receives JPA International Contribution Award for Distinguished Research


Prof. Tetsuro Matsuzawa

Prof. Tetsuro Matsuzawa of the Primate Research Institute was awarded the 2014 International Contribution Award for Distinguished Research by the Japanese Psychological Association (JPA) on 10 September 2014. Prof. Matsuzawa's unique research on chimpanzees paved the way for a new area of research called "comparative cognitive science," and produced internationally lauded results. The award acknowledges his major contribution to the development of psychological research in Japan.

In addition to Prof. Matsuzawa's award, Assistant Prof. Ikuma Adachi of the Primate Research Institute received this year's JPA International Contribution Award for Distinguished Early and Middle Career Contributions. The same award has previously been conferred on Prof. Satoshi Hirata of the Wild life Research Center (2010) and Prof. Masako Myowa-Yamakoshi of the Graduate School of Education (2012).

WEB langint.pri.kyoto-u.ac.jp/ai/en/news/245_2014-09-09.html
WEB www.kyoto-u.ac.jp/en/research/forefronts/matsuzawa.html (Matsuzawa's issue)

TOPIC

Professor Shigefumi Mori Elected President of the International Mathematical Union

Prof. Shigefumi Mori

Prof. Shigefumi Mori of the Research Institute for Mathematical Sciences has been elected as the next President of the International Mathematical Union (IMU). The decision was made at the 17th IMU General Assembly, which took place in Gyeongju in the Republic of Korea on 10–11 August. His term will be from 1 January 2015 to 31 December 2018. Prof. Mori is the first IMU president from the Asian region since the organization's establishment in 1948.

The IMU is an international academic organization dedicated to promoting international cooperation in mathematics. A member of the International Council for Science (ICSU), the IMU is notable as the organization that awards the Fields Medal, often described as the "Nobel Prize of Mathematics."

WEB www.kyoto-u.ac.jp/en/about/events_news/office/soumu/news/2014/140811_1.html
WEB www.kurims.kyoto-u.ac.jp/en/list/MORI,%20Shigefumi.html (Mori's profile)

TOPIC

Professor Takuro Mochizuki Delivers Plenary Lecture at the International Congress of Mathematicians

Prof. Takuro Mochizuki of the Research Institute for Mathematical Sciences (RIMS) presented a plenary lecture at the International Congress of Mathematicians (ICM) in Seoul, Republic of Korea, on 13–21 August. His lecture, titled "Wild Harmonic Bundles and Wild Pure Twistor D-modules," focused on the theory with which he proved "Kashiwara's conjecture," a seemingly intractable problem put forth by Prof. Emer. Masaki Kashiwara of Kyoto University. The theory earned Prof. Mochizuki worldwide acclaim, and with its far-reaching scope it is anticipated to be of key importance in 21st century mathematics. In addition to Prof. Mochizuki, Prof. Takashi Kumagai of RIMS also spoke at the ICM as an invited lecturer.

Prof. Mochizuki delivers his plenary lecture

A plenary session at ICM 2014

WEB www.kyoto-u.ac.jp/en/research/events_news/department/suuri/news/2014/140820_1.html
WEB www.kurims.kyoto-u.ac.jp/en/list/takuro.html (Mocizuki's profile)

Honors

Award Winning Researchers in Kyoto University

The following is a list of just some of the Kyoto University researchers who have received international awards —— a testimony to the university's intellectually fertile environment and culture of academic freedom.

Nobel Prize

in Physics

Hideki Yukawa (1949), **Sin-Itiro Tomonaga** (1965), **Makoto Kobayashi** (2008), **Toshihide Maskawa** (2008), **Isamu Akasaki** (2014) *Photo provided by Meijo University

in Chemistry

Kenichi Fukui (1981), **Ryoji Noyori** (2001)

in Physiology or Medicine

Susumu Tonegawa (1987), **Shinya Yamanaka** (2012)

Fields Medal **Heisuke Hironaka** (1970), **Shigefumi Mori** (1990)

Gauss Prize **Kiyosi Itō** (2006)

Lasker Award **Susumu Tonegawa** (1987), **Yasutomi Nishizuka** (1989), **Yoshio Masui** (1998), **Shinya Yamanaka** (2009) **Kazutoshi Mori** (2014)

Japan Prize **Makoto Nagao** (2005), **Masatoshi Takeichi** (2005)
*Photos provided by the Japan Prize Foundation

Kyoto Prize **Yasutomi Nishizuka** (1992), **Chushiro Hayashi** (1995), **Kiyosi Itō** (1998), **Alan Curtis Kay** (2004), **Isamu Akasaki** (2009), **Shinya Yamanaka** (2010), **Masatoshi Nei** (2013) *Photos provided by the Inamori Foundation

Die Schaudinn-Hoffmann-Plakette	**Shin-ichi Matsumoto** (1965)
Huxley Memorial Medal	**Junichiro Itani** (1984)
Canada Gairdner International Award	**Susumu Tonegawa** (1983), **Yasutomi Nishizuka** (1988), **Shinya Yamanaka** (2009), **Kazutoshi Mori** (2009)
Order of the White Elephant - 3rd Class	**Yoneo Ishii** (1987)
Ross G. Harrison Prize	**Tokindo S. Okada** (1989)
Salem Prize	**Mitsuhiro Shishikura** (1992)
Robert Koch Prize	**Shigekazu Nagata** (1995), **Shinya Yamanaka** (2008), **Tasuku Honjo** (2012)
The Keio Medical Science Prize	**Shigetada Nakanishi** (1996), **Masatoshi Takeichi** (2001), **Koichi Tanaka** (2002), **Yoshinori Fujiyoshi** (2005), **Shimon Sakaguchi** (2008), **Kenji Kangawa** (2009)
Frank Nelson Cole Prize	**Hiraku Nakazima** (2003)
John Dawson Prize	**Tetsuya Sato** (2005)
Yuri Gagarin Medal	**Hiroshi Matsumoto** (2006)
Booker Gold Medal	**Hiroshi Matsumoto** (2008)
The Ulysses Medal	**Shuh Narumiya** (2008)
L.S.B. Leakey Prize	**Toshisada Nishida** (2008)
Prix du Rayonnement de la langue et de la littérature françaises	**Kazuyoshi Yoshikawa** (2010)
de Gennes Prize	**Susumu Kitagawa** (2013)
L'Oréal-UNESCO Awards For Women in Science	**Tomiko Yonezawa** (2005), **Kayo Inaba** (2014)


H. Yukawa


S. Tomonaga


H. Hironaka


K. Fukui


S. Tonegawa


Y. Nishizuka


S. Mori


C. Hayashi *


Y. Masui


R. Noyori


M. Nagao *


M. Takeichi *


K. Ito *


M. Kobayashi


T. Maskawa


S. Yamanaka *


M. Nei *


K. Mori


I. Akasaki *

GLOBAL NETWORK

International Relations at Kyoto University

International cooperation and exchange is an indispensible component of Kyoto University's operations as a world-class higher education and research institution seeking to make a significant contribution to a stable and harmonious global society.

SYMPOSIA & WORKSHOPS

Sweden-Kyoto Symposium, 11–12 September 2014

As the result of a unique collaboration between Kyoto University and four universities in Sweden — Stockholm University, Uppsala University, KTH Royal Institute of Technology, and Karolinska Institutet — the inaugural Sweden–Kyoto Symposium was held on 11–12 September 2014.

The symposium was designed to foster new friendships, strengthen existing partnerships, and promote future collaboration. As Kyoto University had previously established agreements for academic exchange and cooperation with three of the four Swedish universities, the event enabled all parties to deepen ties and explore new possibilities.

More than sixty researchers from Kyoto University joined academic sessions held at each of the four university campuses.

On the first day, Stockholm University hosted an inauguration session attended by H.E. Mr. Seiji Morimoto, Ambassador of Japan to Sweden, and executives from the five universities. Dr. Michiaki Mishima, executive vice-president for international affairs and hospital administration, Kyoto University, expressed his gratitude to the Swedish hosts for their warm welcome. The Swedish universities were represented by Prof. Astrid Söderbergh Widding, president of Stockholm University, Prof. Kerstin Tham, vice-president of Karolinska Institutet, Prof. Peter Gudmundson, president of KTH Royal Institute of Technology, and Prof. Eva Åkesson, vice-chancellor of Uppsala University. A presentation was also given by Dr. Hideo Akutsu, director of the JSPS Stockholm Office.

Keynote lectures were delivered by Prof. Gunnar Andersson and Assistant Prof. Livia Sz OIáh of Stockholm University, Prof. Mathias Uhlén, director of SciLifeLab, and Prof. Susumu Kitagawa, director of Kyoto University's Institute for Integrated Cell-Material Sciences (iCeMS).

In the evening, delegates attended a reception hosted by the Embassy of Japan in Sweden and JSPS Stockholm.

At parallel sessions held on the second day, participants discussed issues ranging from smart energy systems to technologies focusing on human-centered design. Each session representative reported on their discussions and directions for future collaboration. The symposium was brought to a close at Piperska Muren.

The event would not have been possible without the generous support of the Embassy of Japan to Sweden, the JSPS Stockholm Office, Secretary General Edvard Fleetwood of the Japan-Sweden Foundation, and Associate Prof. Atsuto Maki of KTH Royal Institute of Technology.

SYMPOSIA & WORKSHOPS

Kyoto University and National Taiwan University hold second joint symposium, 1–2 September 2014

The second joint symposium between Kyoto University and National Taiwan University was held on the 1–2 of September, aiming to build on the success of the inaugural meeting that took place in Taiwan in December 2013.

Symposium participants at the opening ceremony

Over 300 researchers from numerous fields participated in the 2014 symposium. Based on the special relationship between the two institutions, the symposium brought leading researchers together with the intention of promoting international collaborative work and disseminating research findings across diverse fields, as well as raising the global profile of both universities.

The first day of the symposium opened with welcome addresses by President Hiroshi Matsumoto of Kyoto University and President Pan-Chyr Yang of National Taiwan University. These were followed by overviews of both universities, presented by Executive Vice-President Michiaki Mishima of Kyoto Universty and Dean Luisa Shu-Ying Chang of NTU. A signing ceremony of two memoranda of understanding followed, after which keynote speeches were delivered by Prof. Susumu Noda of Kyoto University and Prof. K. Arnold Chan of NTU Hospital. At the end of the day a special lecture on Kyoto University's research history in Southeast Asia was delivered by Prof. Yasuyuki Kono.

The two presidents shaking hands at the MoU signing ceremony

The results of two days of discussions in fourteen parallel sessions, each dedicated to different fields of research, were presented at a wrap-up session at the end of the second day.

The symposium was then officially brought to a close with addresses by Vice-President Liang-Gee Chen of NTU and Executive Vice-President Kiyoshi Yoshikawa of Kyoto University. It is expected that this meeting will strengthen the partnership and collaborative research activities between the two institutions, and promote the strategic exchange of knowledge, skills, and ideas into the future.

WEB www.oc.kyoto-u.ac.jp/symposium/ku-ntu-symposium2014/en/ (Symposium website)

Symposia & Workshops

Diversity and Conservation of Asian Primates, 18–21 May 2014

21st Kyoto University International Symposium.

The symposium participants

The 21st Kyoto University International Symposium: Diversity and Conservation of Asian Primates was held at the IPB International Convention Center of Bogor Agricultural University (IPB), Bogor, Indonesia on 18–21 May 2014. Over 150 people from eleven countries including Indonesia, Japan, Thailand, Malaysia, Vietnam, the US, and the UK attended the symposium. The Kyoto University delegation comprised approximately thirty members including Dr. Michiaki Mishima, executive vice-president for international affairs and hospital administration, Prof. Hirohisa Hirai, director of the Primate Research Institute, and faculty and staff members from the Primate Research Institute, the Institute for Virus Research, the Wildlife Research Center, and the Research and International Affairs Department.

Since 2000, Kyoto University has hosted international symposia in different fields and at different venues around the world to actively promote international cooperation on creative and advanced academic research. The latest symposium is the 21st in the series. The symposium aimed to promote a new comprehensive understanding of primate evolution and protection, and develop improved measures for environmental preservation and primate protection through the application of knowledge gained from research and clarifying the correlations between conservation measures and political and economic factors.

The symposium's four-day program featured a broad range of presentations and poster sessions covering topics such as genomes, infectious diseases, ecology, conservation, human culture, morphology, and phylogeography. The various sessions provided an opportunity for primatologists, field scientists, and various parties involved in environmental and primate conservation in Japan and other countries to share the latest research developments in primatology and plant and environmental ecology. The symposium provided participants with an opportunity to deepen their understanding of the evolution and current situation of primates in Asia, and to explore new possibilities for protection and preservation measures. Excerpts from the symposium's presentations are publicly available on the Science and Development Network website.

WEB www.sea-primate.org

Exectiive Vice-President Michiaki Mishima and Dr. Sri Nurdiati, dean of the Faculty of Mathematics and Natural Sciences of Bogor Agricultural University exchange Commemorative gifts

Symposia & Workshops

Challenges for University Museums, 20–23 May 2014

Report on the 2nd APRU Research Symposium on University Museums.

Following the success of the 1st Association of Pacific Rim Universities (APRU) Research Symposium on University Museums, which was held in 2012 at the Kyoto University Museum (KUM), the 2nd symposium, titled "Reshaping Outreach Services of University Museums through Innovation and Partnership," was held at National Taiwan University on 20–23 May 2014. The symposium included three keynote speeches and forty-six oral and poster presentations from thirteen countries.

Universities are now gradually recognizing the importance of "outreach services" in generating interest in academic research, gaining support from society, and recruiting talented students. University museums are regarded as a center of such activity. Participants in the symposium exchanged their ideas, achievements, and challenges concerning this new and important activity of university museums.

The KUM sent a delegation of seven people—the largest delegation among the participating institutions. Dr. Terufumi Ohno, director of the KUM, was one of the keynote speakers. In his presentation, he stressed the importance of developing communication ability in school children through university outreach activities, particularly by their museums. Other members of the delegation presented recent examples of KUM outreach activities. The special exhibition of "Diversity of Ocean Research at Kyoto University" held in 2013 was based on research results in both natural science and humanities fields. The exhibition raised the participating researchers' awareness of the importance of interdisciplinary research. The Weekend Children's Museum is a learning program for children that has been operated every weekend by the university's students for over ten years. The students introduce children to interesting learning activities based on their research. The program also benefits the students by improving their scientific communication abilities.

These examples demonstrate that outreach services are an important element of university museum activities, not only in terms of their contributions to society, but also in promoting the further development of the museums in both practical and conceptual terms.

Author: **Yusuke Senoo** *Researcher, Kyoto University Museum*
www.museum.kyoto-u.ac.jp/

Symposia & Workshops

Asia-Pacific Women in Leadership Workshop, 1–2 July 2014

The Asia-Pacific Women in Leadership (APWiL) Workshop was organized by Kyoto University and held at the Kyoto University Tokyo Office on 1–2 July 2014. Over fifty participants from sixteen institutions joined the workshop. APWiL is a major initiative launched by the Association of Pacific Rim Universities

(APRU), an association of forty-five leading research universities in the Pacific Rim region.

The first day of the workshop began with a welcome address by the APWiL Program chairperson, Prof. Masako Egawa, executive vice-president of the University of Tokyo. An overview of the workshop was then provided by Prof. Yasuko Takezawa of Kyoto University, which was followed by a discussion on institutional strategies and issues in advancing the participation of women in universities.

The second day of the workshop opened with remarks from Prof. Kayo Inaba, excective vice-president for gender equality and director of the Gender Equality Promotion Center of Kyoto University, which was followed by an address by guest of honor H.E. Ms. Kumiko Bando, deputy minister of the Ministry of Education, Culture, Sports, Science and Technology of Japan. Prof. Jeanette Takamura, dean of the Columbia University School of Social Work, then delivered her keynote speech, in which she described the current situation in US academia with regards to leadership by women, and spoke encouragingly about potential developments in Japan.

Exective Vice-President Kayo Inaba

Vice-President for Interenational Relations Junichi Mori

Prof. Yasuko Takezawa, Institute for Research in Humanities

The participants then discussed various issues surrounding the workshop's theme during group and plenary sessions, and the results of the workshop were formalized in an official proposal. The next APWiL workshop is planned to be held at the University of Auckland in 2015.

FRIENDSHIP & COOPERATION

Education and Research Developments at the Graduate School of Global Environmental Studies

The Graduate School of Global Environmental Studies (GSGES), established in 2002, is a small graduate school, but unique in terms of education, activities, and members. Table 1 shows the school's international projects. In its first few years, the school had no such projects, but in 2007 it launched the Asian Platform, using its own budget. The project was carried out in Hue, Vietnam, and subsequently expanded to Danang. The achievements of the Asian Platform not only stimulated the international activities of GSGES, but also facilitated the acquisition of external research and education funds for projects relating to ASEAN countries. The JICA Grass-Roots Project was the first project based on the Asian Platform, and the Environmental Management Project (EML), which spanned the period 2008–12, significantly expanded international education collaboration with Vietnam and other ASEAN countries.

Table 1 ◆ GSGES History of main international Projects

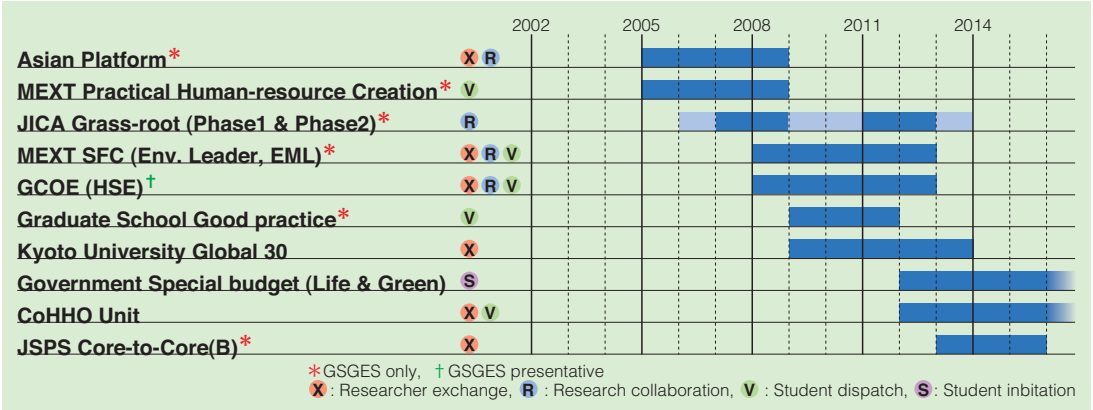


Table 2 ◆ Performance of GSGES on education and research collaboration with ASEAN universities

Workshops (Date, joining countries/universities/participants)

1st Hue, Vietnam (6-7 Mar 2010, 4/10/42)	4th Siem Reap, Cambodia (9 Mar 2012, 4/5/62)	7th Kyoto, Japan (25 May 2014, 7/10/39)
2nd Kyoto, Japan (24 May 2010, 5/7/43)	5th Kyoto, Japan (7 Mar 2013, 5/8/53)	8th Bangkok, Thailand (27 Jun 2014, 5/11/21)
3rd Hue, Vietnam (7 Mar 2011, 4/6/51)	6th Hoi An, Vietnam (16 Sep 2013, 5/13/99)	9th Can Tho, Vietnam (27 Sep 2014, 6/18/88)

Countries (internship students#/enrolled MC students#/enrolled DC students# – Travel days, day*person†/Travel times†); #FY2002-13, †FY2010-12

Burma (0/0/0 – 49/8)
Cambodia (3/0/2 -552/32)
Royal Univ. of Agr.,▲ Royal Univ. of Phnom Pen●
Indonesia (2/4/3 – 978/57)
Bogor Agr. Univ.☆
Laos (2/0/0 – 428/23)
Champasak Univ.▲
Malaysia (6/4/8 –1354/65)
Univ. of Technol. Malaysia▲
Philippines (5/6/5 – 613/22)
Vietnam (41/5/23 – 6396/230)
Danang Univ.,★ Hanoi Univ. of Sci. and Technol.,★
Hanoi Univ. of Civil Engineer.,▲ Hue Univ.,★
Vietnam Acad. of Sci. and Technol.▲
Singapore (1/1/0 – 218/18)
Thailand (23/3/5 – 2015/107)
Asian Institute of Technol.,▲ Chulalongkorn Univ.,●
Kasetsart Univ.,● Khon Kaen Univ.,△ Mahidol Univ.★

☆★university level MOU proposed by GSGES, ●other university level MOU, △▲school level MOU by GSGES, ★●▲student internship activities, ☆△others

Campus and Office
Hanoi Field Campus, Hue Field Campus, Danang Satellite Office

These international projects have yielded substantial education and research outcomes in collaboration with ASEAN countries, as shown in Table 2. Notable achievements include: (1) Memoranda of Understanding (MOU) initiated by GSGES (five university-level and six faculty-level MOUs); (2) Regular Indochina workshops conducted with ASEAN universities (nine held since 2009); (3) Three overseas offices established in Hanoi, Hue, and Danang, Vietnam; (4) Eighty-three internship students dispatched to ASEAN countries; (5) Thirty-eight master's and twenty-three doctoral students hosted from ASEAN countries. The school intends to further expand its international collaboration in the ASEAN region.

Author: **Shigeo Fujii, PhD** *Dean, Graduate School of Global Environmental Studies*
www2.ges.kyoto-u.ac.jp/members/fujii-shigeo/

POINTS OF INTEREST 1

Experimental Station for Medicinal Plants

The Experimental Station for Medicinal Plants operated by Kyoto University's Graduate School of Pharmaceutical Sciences, cultivates and manages a large assortment of valuable medicinal plants, including specimens obtained by researchers during overseas field research. The plants are used for education and research in pharmaceutical science fields. The station cultivates 300–400 varieties of natural medicinal plants in an area of approximately 700 square meters, including greenhouses. The station is located next to the Pharmaceutical Sciences Research Building, and is closely involved in its education and research activities. Among the specimens being cultivated at the station are medicinal plants collected in Vietnam and Laos by the station's manager Associate Prof. Michiho Ito, which are not being cultivated anywhere else in Japan.

Once a year the station opens to the public. This year's open days were on 24 and 25 October. The open days were blessed with good weather, and four groups comprising a total of 170 visitors enjoyed guided tours led by Prof. Ito. The open days will be held again next year, and we invite you to join us.

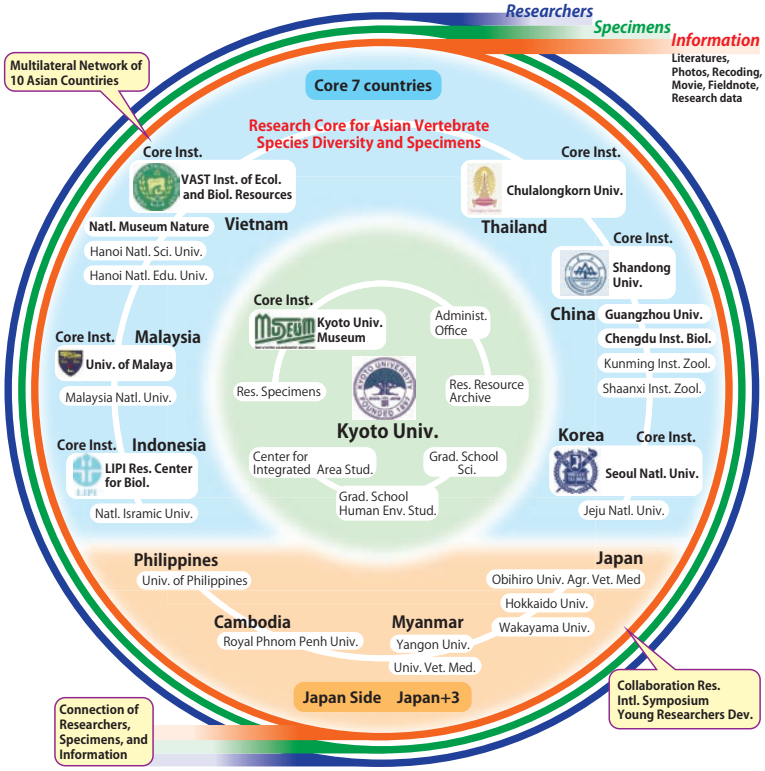
WEB www.pharm.kyoto-u.ac.jp/en/research/facilities/esmp/ (Experimental Station for Medicinal Plants)
www.pharm.kyoto-u.ac.jp/shoyaku/members.html (Michiho Ito, PhD)

Contributing to the World and the Local Community

NAT HIS

Asian Vertebrate Species Diversity Network Platform

The Kyoto University Museum has launched a three-year initiative under the JSPS Core-to-Core Program titled "Asian Vertebrate Species Diversity Network Platform with Combining Researchers, Specimens and Information." The project is categorized within the JSPS program, as a type B project to develop Asia–Africa science platforms in 2014–2016. In addition to Kyoto University, the project involves six academic institutions in Asia as core members: Shandong University (China), Seoul National University (Korea), the Institute of Ecology and Biological Resources of the Vietnam Academy of Science and Technology (VAST) (Vietnam), Chulalongkorn University (Thailand), the University of Malaya (Malaysia), and the Research Center for Biology of the Indonesian Institute of Science (LIPI) (Indonesia). Coordinated by Associate Prof. Masaharu Motokawa of the Kyoto University Museum, the project involves 129 researchers from the core member and other institutions from ten countries throughout Asia, including institutions in the Philippines, Cambodia, and Myanmar. The project builds on the achievements of the 2011–2013 JSPS Asia–Africa Science Platform Program, "Research Platform for East Asian Vertebrate Species Diversity and Formation of Specimen Network." The projects aim to form an Asian multilateral network platform, connecting researchers, specimens, and information, and facilitating a broad range of activities such as collaborative research, international symposia, and initiatives to foster young researchers. In December 2014, to mark the first year of the new project, the 4th International Symposium on Asian Vertebrate Species Diversity will be held at the University of Malaya. The symposium sees to promote academic exchange and discussion among experienced and young researchers on the effective operation of the network platform from Kyoto University towards the global scientific community.



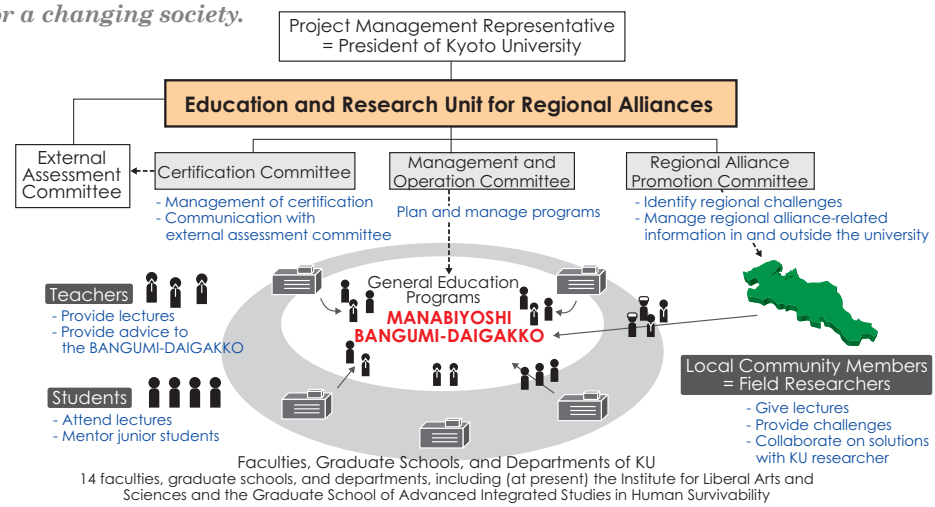
Masaharu Motokawa, PhD *Associate Professor, The Kyoto University Museum*

WEB www.museum.kyoto-u.ac.jp/acore/

EDU

Kyoto Future Creation Project for Establishing the Center of Community

Cultivating leaders for a changing society.



This project provides a forum for exchange between local communities and universities. It aims to take advantage of the advanced knowledge developed by universities to solve regional problems. It also aims to implement open-access education involving the local community in order to strengthen the hands-on problem solving skills of students.

Specifically, Kyoto University provides a classroom program for freshman and sophomore students called *Manabiyoshi*, which literally means "qualified learning." The course focuses on the city of Kyoto, and is intended to foster attitudes that challenge the status quo, improve open-mindedness, and cultivate a sense of responsibility. Furthermore, in the sophomore to senior program, students engage in a field work program named *Bangumi Daigakko*, which comprises three courses that may be freely selected by the students. The aim of this program is to foster creativity, the ability to solve real-life problems, and the power to take advantage of knowledge. Together, the *Manabiyoshi* and *Bangumi Daigakko* programs are called The Education Program for Kyoto.

This five-year project was selected as a Project for Establishing the Center of Community 2013 supported by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). The application for project was greatly assisted by the Kyoto University Research Administration Office (KURA). The project aims to realize the aims of Kyoto Vision 2040, an initiative which was proposed by the Social Gathering to Think about the Future of Kyoto, and whose organizers include leading politicians, businesspersons, and representatives from various sectors, including former Kyoto University president, Dr. Hiroshi Matsumoto.

Students who gain the program credits will be awarded a certificate of Global Top Leader Human Resource. Ultimately, Kyoto University seeks to instill a sense of Kyoto as a hometown for students, and produce human resources responsible for the sustainable development of Kyoto with the aim of contributing to harmony in the international community.

Shigeru Takami, PhD

Professor, Graduate School of Education / Unit Leader, Education and Research Unit for Regional Alliances

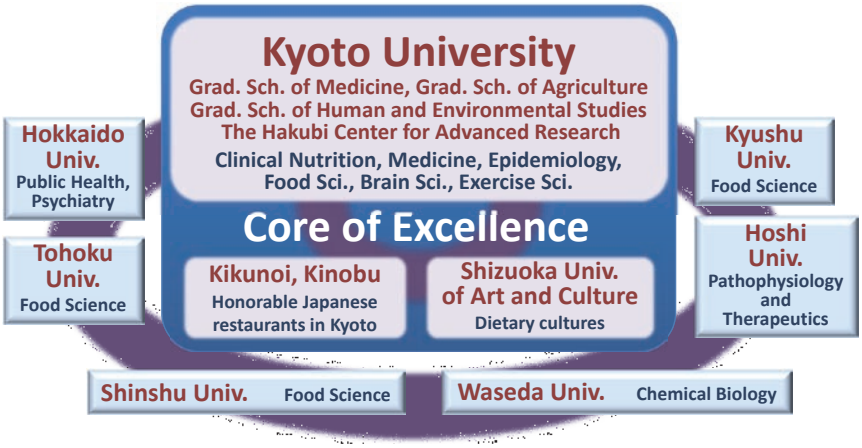
WEB www.coc.kyoto-u.ac.jp

INTERDISCIP RES

Healthy Japanese Cuisine for the World

Evaluation of the Japanese diet as a potential model for human health.

In June 2014, we applied for a competitive research funding 'Integration research for agriculture and interdisciplinary fields' of the Ministry of Agriculture, Forestry and Fisheries, and were selected as a core of excellence project for our evaluation of the Japanese diet. In August, our project started under



the title "A multifaceted investigation of possible contributions of Japanese diet to world health".

Traditional Japanese cuisine, or *washoku*, was just added to the world's intangible heritage list in December 2013. Now is a good time to promote a better international understanding of Japanese eating habits, and reevaluate the strengths of these practices. Japanese food has long been considered to be healthy, but scientific evidence is surprisingly limited. The core characteristics of the Japanese diet are not really fully defined, both generally and in an academic context. Due to uncertainty surrounding its basic characteristics, scientific research has been slow to take off.

In this project we first try to specify the important characteristics of the Japanese diet by reviewing traditional dietary cultures of Japanese society, as well as common medical and nutritional thought. Here we also consider the state of Japanese cuisine abroad and the expectations of consumers internationally. Accordingly we proceed with a multifaceted investigation of the Japanese diet including contributions from clinical nutrition, medicine, epidemiology, food science, brain science, and the study of exercise. In September, six additional universities were selected to compliment our research. Together we aim to clarify various effects of the Japanese diet on physical and mental health and athletic ability, and also investigate culinary effects on the foods and the mechanism of the cuisine's deliciousness.

The Japanese Culinary Academy, which consists of energetic chefs of Japanese restaurants, will cooperate with us in the form of offering advice from a perspective of culinary expertise. Additionally the city of Kyoto, which emphasizes food education in its elementary schools, will also assist in sharing the results of the research with the greater community.

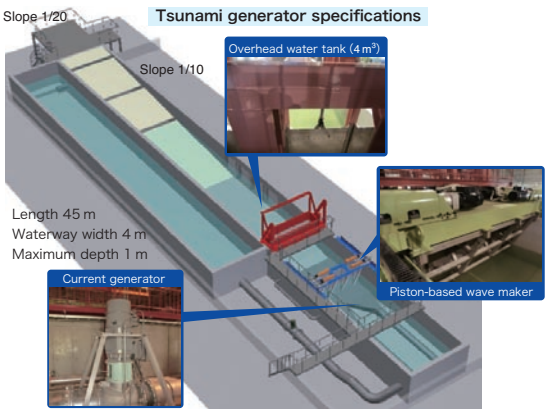
Kaori Ikeda, MD, PhD (left) **and Nobuya Inagaki, MD, PhD**
Assistant Professor and Professor, Graduate school of Medicine
WEB metab.kuhp.kyoto-u.ac.jp/

NAT DIS REDUCT

A New Generation for Tsunami Research

Implementing new experimental equipment to study the phenomena.

A new type of tsunami generator, forty-five meters long and four meters wide, has been developed in the University's Ujikawa Open Laboratory of the Disaster Prevention Research Institute. The generator is composed of a piston-based wave maker with a long stroke, a current generator, and an overhead water tank. The combination of waves generated by this apparatus is capable of reproducing any type of tsunami



wave. The current generator, in particular, is needed to produce the long period tsunami profiles that follow initial bore-type waves. The water tank, meanwhile, can not only produce tsunami caused by volcanic eruptions, but also by a spike in the bore. This versatility makes this generator the only one of its kind in the world.

The apparatus is currently being used to investigate the effectiveness of removable breakwaters, and as its next project, tsunami pressure distribution around buildings located in high-impact zones. The experimental results will be applicable to studies of tsunami hazard characteristics, and in verification of numerical simulation models. The generator's contributions are eventually expected to reduce hazard levels and increase coastal front resilience.

Tetsuya Hiraishi, PhD

Professor, the Research Center for Fluvial and Coastal Disasters, Disaster Prevention Research Institute

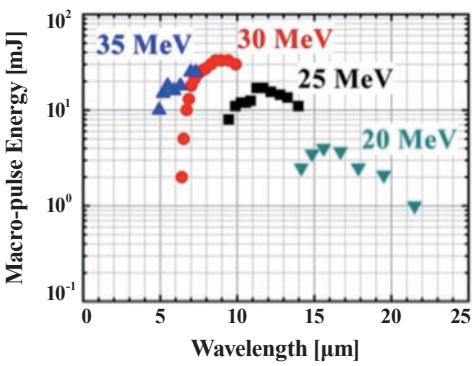
WEB kyouindb.iimc.kyoto-u.ac.jp/e/vV9cN

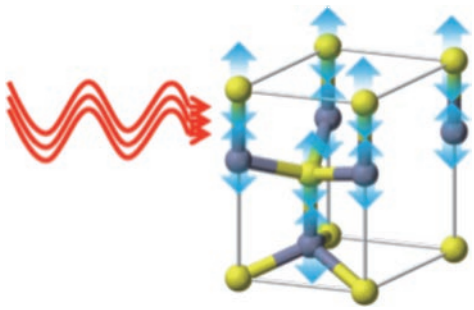
Quantum Beam Tech

Widely-Tunable Mid-Infrared Laser Developed

Give our high peak-power, short duration MIR-laser a try in your lab!

A high peak power (-MW), widely tunable (5–20 μm) Mid-Infrared Free Electron Laser (MIR-FEL) has been developed by our research group at the Institute of Advanced Energy on the Uji Campus. MIRs, which correspond to the absorption wavelengths of phonons, plasmons, and molecular vibrations, can be used for selective dissociation or excitation of chemical bonds. In addition, the pulse width of the MIR-FEL is sufficiently short (-600 fs) to observe ultrafast dynamics, such as energy redistribution of phonons, electron relaxation in quantum dots, non-linear optics, spin dynamics, impurity studies in semiconductors, and much more. As an example of MIR-FEL applications, mode-selective phonon excitation of a bulk material (single-crystal SiC) was demonstrated for the first time using anti-Stokes Raman scattering spectroscopy. This type of basic research is expected to contribute to the development of high efficiency functional materials for use in supporting a zero-emission energy future for society.





Hideaki Ohgaki, PhD

Professor, Institute of Advanced Energy

WEB www.iae.kyoto-u.ac.jp/quantum/index-e.html

About the Cover

Sonjo-do

The Sonjo-do was completed in 1903. It was originally built by the politician Yajiro Shinagawa, from Choshu Domain, as a facility to honor the spirit of loyal supporters of the Meiji Restoration and to display their mementos. The building was donated to Kyoto University after Shinagawa's death.

Painter: **Kiyoko Yamaguchi, PhD**

Alumnae of Kyoto University

WEB kiyoko-hk.blogspot.jp

FOSTERING THE NEXT GENERATION

白眉 — The Hakubi Project

A Unique Opportunity for Outstanding Young Talent

The Hakubi Project was established by Kyoto University in 2009 to foster outstanding young researchers. The program recruits twenty international researchers per year as associate and assistant professors. It gives them a valuable opportunity to devote themselves entirely to their research. The project is open to any researcher in any academic field. WEB www.hakubi.kyoto-u.ac.jp/eng

MED-BIOL

Temporal Regulation of Auditory Hair Cell Differentiation

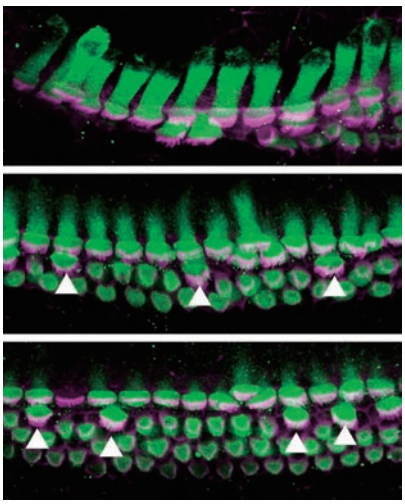
Hedgehog signaling forms the basal-to-apical wave of hair cell differentiation in mammalian cochlea.

Mammalian cochleae are "snail-like" hearing organs in the inner ear, containing the sensory epithelium, called the organ of Corti, where mechanosensory hair cells are arranged in rows along the entire length of the cochlear coil. Hair cell differentiation proceeds from the basal to the apical region of the cochlea, but the mechanism and significance of this remain to be elucidated. Our colleagues and I investigated the role of Hedgehog (Hh) signaling in cochlear development using transgenic mice, and found that Hh signaling delays hair cell differentiation in the apical region, which forms the basal-to-apical wave of development. Downregulation of Hh signaling caused hair cell disarrangement and hearing impairment suggesting that the basal-to-apical wave is required for hearing ability.

Tomoko Tateya, MD, PhD

Assistant Professor, The Hakubi Center for Advanced Research / Institute for Virus Research

www.hakubi.kyoto-u.ac.jp/eng/02_mem/h24/tateya.html



Deformity of hair cell rows in the apical part of cochlea by downregulation of Hh signaling (arrow heads indicate abnormal hair cells)

ECON

How to Pay for Our Health

Integrating scientific evidence and social values for future healthcare policy formulation.

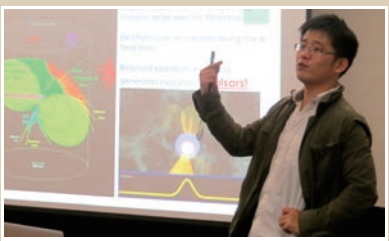
Total healthcare expenditure makes up nearly 10% of Japan's economy, and roughly 85% of universal healthcare is financed by social insurance and tax. Yet given the size of the national debt, it is

POINTS OF INTEREST 2

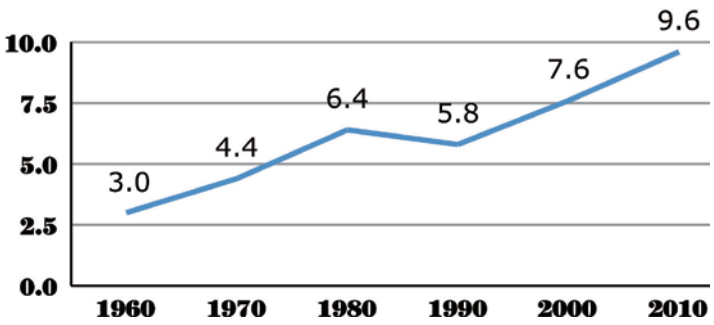
The Hakubi Seminar

Hakubi seminars are held at the Hakubi Center twice a month (on the first and third Tuesdays at 16:00), organized on a rotational basis by the Hakubi researchers themselves. These regular gatherings are attended by all Hakubi researchers. In April 2011, English became the official language for presentations and discussions.

WEB www.hakubi.kyoto-u.ac.jp/eng/03_sem/index.html



Dr. Takayuki Saito



Total Healthcare Expenditure / Total GDP (%) : 1960-2010

impossible to meet all of society's healthcare needs, making the determination of budget priorities (taking into account both cost and effectiveness) a burning social issue. Medical research can provide scientific evidence regarding the degree to which specific technologies improve health. However, how much can and should our society be prepared to pay for these solutions? Are there technologies which should be given higher priority than others? I am gathering data regarding social preferences in healthcare resource allocation, and anticipates that this information will make an important contribution to the healthcare policymaking process.

Rei Goto, MD, PhD

Associate Professor, The Hakubi Centre for Advanced Research / Graduate School of Economics

www.hakubi.kyoto-u.ac.jp/eng/02_mem/h24/goto.html

FOR-HIDROL

Post-modern Forestry

Why do we think in economic terms?

I am proposing a new concept of forestry. Japan has shown that modernization causes commercial forestry to stagnate, resulting in a degradation of forested areas. This can usually be explained economically, in the sense that forestry is no longer an attractive mode of employment due to rising standards of living resulting from modernization of society. Hence while typical research has focused on finding methods to make forestry economically feasible, I instead examine why people think economically, which was not as common before modernization. Examining differences between the times before and after modernization, I propose a new concept of forestry which may be feasible in this post-modern world.

Hikaru Komatsu, PhD

Associate Professor, The Hakubi Center for Advanced Research / Graduate School of Agriculture

www.hakubi.kyoto-u.ac.jp/eng/02_mem/h24/komatsu.html

Oharame: Female firewood sellers from Ohara area in Kyoto before modernization. (From Kyoto University Digital Library: http://edb.kulib.kyoto-u.ac.jp/exhibit/ishin/kanren/doc/big/0246006.html)

What's in a Name?

The term hakubi (白眉), literally means 'white eyebrows' in Japanese (白 : white, 眉 : eyebrows). The word originates from a Three Kingdoms era (220-280 AD) Chinese legend: "Three kingdoms saga (三国志)." According to the legend, one of the kingdoms, called Shu (蜀), was home to five brothers with extraordinary talents. The fourth brother; 馬良季常 (Baryō Kijō), who was particularly outstanding, had white hairs in his eyebrows, and so the term hakubi has come to refer to particularly talented individuals.

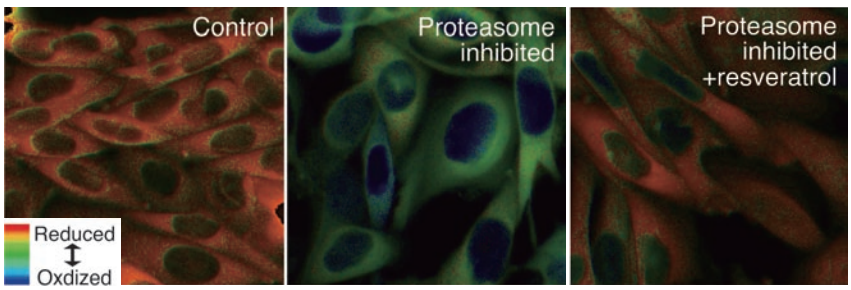
Cutting-Edge Research at Kyoto University

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.

MOL-CELL-BIOL

Anti-aging Compounds Act in Mitochondria

Resveratrol and sesamin function as antioxidants in mitochondria against cell death.



Visualized intracellular redox state

Impairment of proteasome that is the protein machinery responsible for degradation of abnormal proteins have been strongly associated with cell death–mediated aging and the pathogenesis of neurodegenerative disorders, eg Alzheimer's and Parkinson's disease. However, the mechanism by which inhibition of proteasome in cells causes cell death is still unclear. By visualizing intracellular redox state, we revealed that proteasome inhibition led to mitochondrial oxidation followed by cytosolic oxidation, which could be prevented by mitochondrial-targeted antioxidants. Moreover, compounds found in red wine and sesame — resveratrol and sesamin, respectively — prevented intracellular oxidation and improved cellular survival by maintaining mitochondrial function.

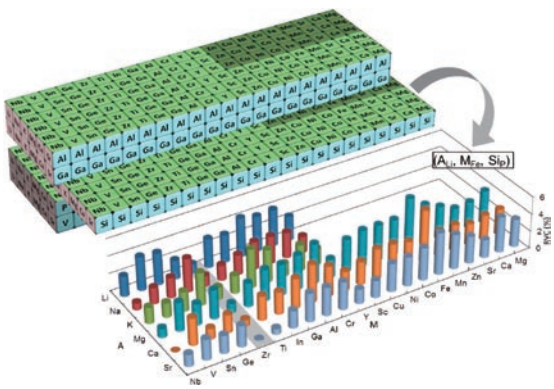
Yasuyoshi Sakai, PhD (left) *Professor, Graduate School of Agriculture*
Jun Hoseki, PhD *Associate Professor, Research Unit for Physiological Chemistry*
www.seigyo.kais.kyoto-u.ac.jp/

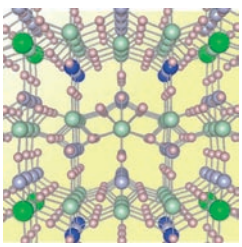
MATS-SCI

Battery Materials with a 70-Year Cycle-Life

Computer-Aided Discovery of New Materials.

Large-scale battery systems are essential for efficiently utilizing renewable energy power sources from solar and wind, which can generate electricity only intermittently. The use of lithium-ion batteries (LIB) to store the generated energy is one solution. A long cycle life is critical for LIB when used in these applications. Together with an industry partner, we demonstrate a novel cathode material with estimated capacity





retention of 25,000 cycles that corresponds to a 70-year lifetime with a daily charge/discharge cycle. The material with a lifetime six times longer than the conventional one is found by exploring a wide chemical composition space using computers. The targeted material is successfully synthesized by an elaborate chemical route and shows excellent cycle-life performance as lithium-ion battery cathodes.

Isao Tanaka, PhD *Professor, Graduate School of Engineering*
cms.mtl.kyoto-u.ac.jp/

ANIM-BEHAV

Wolves Communicate with their Eyes

Understanding the behavior of wolves through gaze communication.

Our research interest involves understanding how gray wolves (*Canis lupus*) use their gaze to communicate. Wolves have facial color patterns that make their gaze direction easily identifiable. Although wolves show various body color variation, they all have eyes with a bright yellow iris. To the human eye, their gaze seems very sharp and impressive. Through our research comparing facial color patterns and behavior in Canidae (dog family), we suggest that facial color patterns are related to gaze communication and that gray wolves communicate with one another via gaze signal.

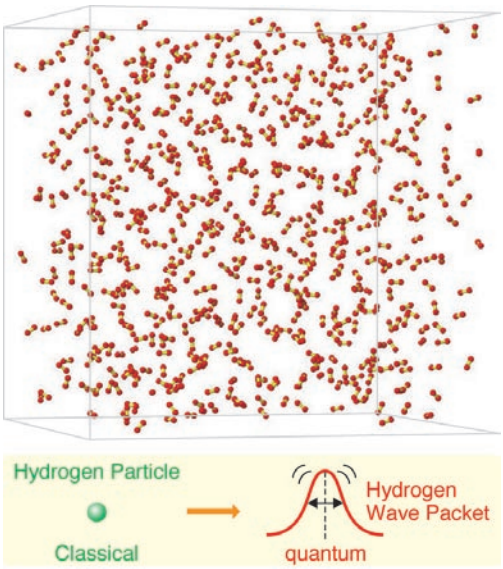
As dogs are domesticated wolves, they share the ability of gaze communication and can understand other dogs' as well as human gaze signals. Our study can be helpful not only in understanding the behavior of wolves but also domestic dogs, the most popular companion animals.

Sayoko Ueda, PhD (left) **and Shiro Kohshima, PhD**
Academic Affairs Staff and Professor, Wildlife Research Center
www.wrc.kyoto-u.ac.jp/en/index.html

STAT-PHYS

When Simple Liquids are not so Simple

Simplest hydrogen liquid exhibits mysterious properties that never appear in ordinary liquids.



Hydrogen (H_2) is the simplest of all molecular species. Defining a hydrogen nucleus, the lightest atom in the periodic table, is not straightforward. Instead of a "particle", it is rather like a wave packet. Actually, this simplest atom exhibits strong nuclear quantum effects (NQEs) — the nucleus cannot stop "beating" and can be spatially delocalized. Such NQEs of hydrogen nuclei in an H_2 liquid dominate the structure and thermodynamic properties, making it mysterious. Liquids exhibiting NQEs are called quantum liquids, and show phenomena that have never been observed for ordinary classical liquids. Understanding microscopic molecular dynamics and the resulting anomalous properties of quantum liquids remains an open problem. I am elucidating unexplained anomalous properties of quantum liquids by developing a new computational method taking into account NQEs that can be applied to a many-molecule system with feasible computational cost. The developed method provides intuitive understandings of real-time dynamics of H_2 molecules even in the liquid phase including its H-H bond vibrations, molecular orientations and librational motions.

Kim Hyeon-Deuk, PhD
Assistant Professor, Graduate School of Science
www.kuchem.kyoto-u.ac.jp/organization/member/kim.html

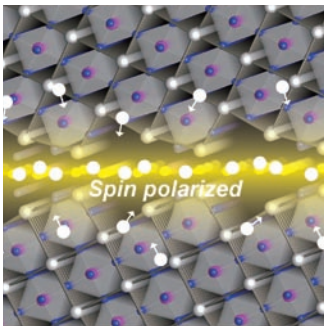
From the Editor This research got an honor of the first paper listed and introduced in the formal email letter of *The Journal of Chemical Physics*.

MECH-ENG

Multi-Physics in Nanostructures

Mechanical strain in nanostructures develops novel functionalities.

Materials of nanoscale dimensions arouse remarkable interest, motivated by the diverse utility for nanotechnology. However, the functionality of materials is suppressed and often destroyed due to their extremely small dimensions. Using a state-of-the-art approach based on quantum mechanics, I have demonstrated that the mechanical stress or strain applied to materials strongly enhances, recovers, and sometimes newly develops, the electric, ferroelectric, magnetic, and various properties at the nanoscale, ie, "Multi-Physics", due to nonlinear behaviors of atoms and electrons. Engineering mechanical strains at the nanoscale therefore enables us to exploit and design novel functionalities and open up new avenues for promising paradigms and novel functional devices.



Emergence of magnetism in deficient lead titanate nanocrystals

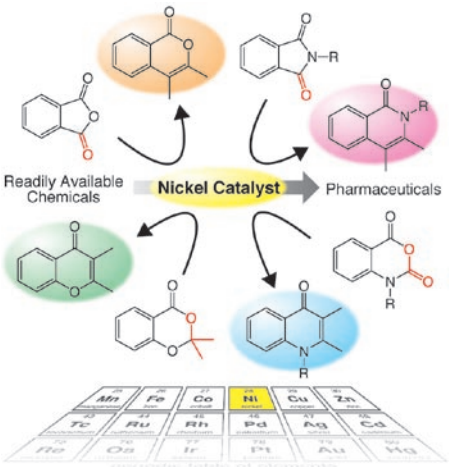
From the Editor By this achievement, Dr. Shimada received the Young Scientists' Prize of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology this year.

Takahiro Shimada, PhD *Assistant Professor, Graduate School of Engineering*
kyouindb.iimc.kyoto-u.ac.jp/e/gT3rQ

ORG-CHEM

What Does a Catalyst Do?

Catalyst opens the way for divergent synthesis of pharmaceuticals.



Various catalysts perform essential functions to produce a wide variety of chemical substances that are an indispensable part of our daily life. Therefore, the development of new catalysts to provide valuable chemical substances, which cannot be made by conventional methods, is a topic of great interest not only in the laboratory but also in industrial production research. During the course of my research to develop new organic reactions with catalysts, I found that one particular element, nickel, could facilitate the production of many chemicals for pharmaceuticals; the nickel catalyst opens the way for divergent synthesis of pharmaceuticals from readily available chemicals.

From the Editor By this achievement, Dr. Kurahashi received the Young Scientists' Prize of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology this year.

Takuya Kurahashi, PhD
Associate Professor, Graduate School of Engineering
www.dfm.kuic.kyoto-u.ac.jp/

The John Mung Program

Opportunities to Explore Global Frontiers

Kyoto University launched the John Mung Program* (Kyoto University Young Scholars Overseas Visit Program) in 2012, as a project to support mid- and long-term research by junior faculty members at leading academic institutions overseas.

*The program is named after the Japanese sailor, Nakahama Manjirō, also known in English as "John Mung," who was the first Japanese to set foot on American soil in 1841. After he returned to Japan, he became a pioneering figure in developing the country's international relations.

DISASTER-MANAG

Neighborhood Power

Rebuilding homes and neighborhoods after the 1991 East Bay Firestorm


Dr. Ochiai (left) with Prof. Tobriner

ICT

Toward a New Epilepsy Model of Care

Development of a Seizure Prediction System.

Epilepsy is a common neurological disorder characterized by seizures, which afflicts around 1% of people worldwide. If patients can be given a warning before seizure onset, their quality of life may be improved because they can avoid accidents.

Based on a theory that excessive neuronal activities associated with epilepsy affect the heart rate pattern, we have developed an epileptic seizure prediction system through monitoring patients' heart rate patterns. Our system consists of a heart rate sensor and a smartphone app; the sensor measures the heart rate pattern and the app analyzes it for seizure prediction in real time.

Wearable HR Sensor

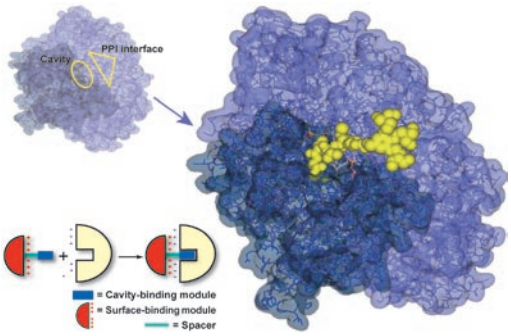
Our system has been tested in hospitals, and it will be ready for practical use hopefully in about ten years. There is a possibility that our system may lead to the creation of a new epilepsy patient care scheme.

Koichi Fujiwara, PhD *Assistant Professor, Graduate School of Informatics*
human.sys.i.kyoto-u.ac.jp/fujiwara/eng/index.html

BIOORG

Chemicals Modulate Protein Interactions

Assembled, mid-sized molecules recognize large and flat protein surfaces.



In humans, hundreds of thousands of protein-protein interactions (PPIs) play critical roles in regulating biological functions, and their dysregulation causes a number of diseases. Compounds that control PPIs have gained much attention due to their large potential application in new therapeutics. My research focuses on design of synthetic agents that recognize large protein surfaces, and disrupt and detect PPIs that are implicated in pathogenesis. Our molecular design is based on the module assembly; small compounds are designed for local protein surfaces, and are assembled to create mid-sized multivalent agents. For example, the assembled chemical probe consisting of an antitumor agent was found to detect intracellular PPIs efficiently. This probe may be useful for understanding the biology underlying the unique antitumor activity.

Junko Ohkanda, PhD *Associate Professor, Institute for Chemical Research*
www.scl.kyoto-u.ac.jp/~johkanda/

I had an opportunity to conduct independent research at the University of California, Berkeley, USA for a year from October 2013 to September 2014. Receiving direction from Berkeley Professor Mary Comerio and Professor Emeritus Steven Tobriner, who are internationally recognized experts in disaster recovery architecture, I focused my study on how citizens in neighborhoods reconstructed their homes and communities after the large scale 1991 fire in Oakland and Berkeley, with particular emphasis on understanding citizens' efforts to influence reconstruction efforts. The John Mung Program was essential in providing an opportunity to investigate these aspects of reconstruction, including meetings with scholars, visiting archives, and interviewing survivors. I will continue my study to better understand the social dynamics of disaster reconstruction.

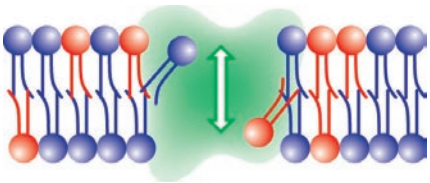
Neighborhood emergency exercise

Chiho Ochiai, PhD
Assistant Professor, Graduate School of Global Environmental Studies
www.gea-lab.ges.kyoto-u.ac.jp/

MED-CHEM

Phospholipid Scrambling on Plasma Membranes

Identification of membrane proteins regulating phospholipid scrambling.



Phospholipids are asymmetrically distributed at plasma membrane in normal cells, but their distribution is collapsed by phospholipid scrambling in various biological situations such as blood clotting and apoptotic cell death. Although the molecular mechanism of phospholipid scrambling was unknown until recently, Dr. Shigekazu Nagata and I found that phospholipid scrambling is mediated by at least two independent mechanisms. An eight transmembrane-containing protein TMEM16F Ca(2+)-dependently promotes the phospholipid scrambling in activated platelets for blood clotting. On the other hand, a six transmembrane-containing protein Xkr8 is activated by caspases during apoptosis and promotes the phospholipid scrambling, thus exposing phosphatidylserine as an "eat-me-signal".

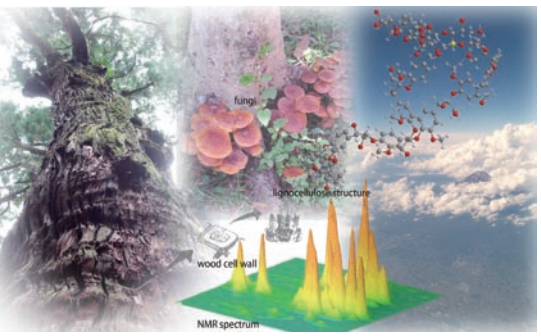
From the Editor Dr. Suzuki received Young Investigator Prize from The Japanese Biochemical Society and The Young Scientists' Prize from the Minister of Education, Culture, Sports, Science and Technology.

Jun Suzuki, PhD *Assistant Professor, Graduate School of Medicine*
www2.mfour.med.kyoto-u.ac.jp/~nagata/english/index.html

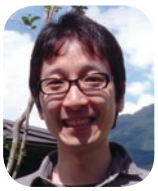
WOOD-CHEM

Trees, Fungi, and Humans — in Harmony with the Earth

Open complicated wood molecules and bioconversion.



Trees are essential to life. Their tall, large structures are supported by a recalcitrant substance called lignocellulose, made up of complex and large molecules consisting of polysaccharide and lignin, which are assembled and form a 3D network. My investigations concern the molecular structure and formation of lignocellulose in wood cell walls. Fungi have a deep association with trees. Wood-rotting fungi have an ability to degrade wood. How they "eat" wood is the other question. To explore these areas, I work on the development of analytical methods using nuclear magnetic resonance and mass spectroscopy. Trees can be used not only for wooden buildings and products but also for chemicals and energy. Thus, learning from nature and converting lignocellulose in an environmentally friendly system, trees and fungi would help to promote a sustainable future.



Hiroshi Nishimura, PhD *Assistant Professor,Research Institute for Sustainable Humanosphere*
www.rish.kyoto-u.ac.jp/W/LBC/

ART-HIST

Longing for Curiosity, Novelty, and Preciousness

Paintings on Special Supports in Sixteenth-Century Europe.

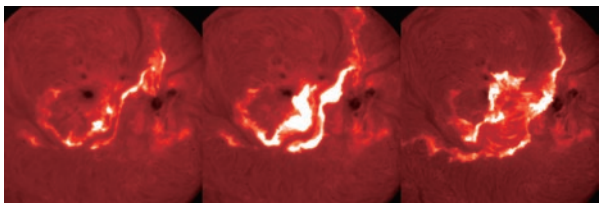
The standard form of painting in European art, that is, oil painting on wood panels or canvas, was established in the late sixteenth century. Some artists, however, went against the stream and ambitiously used stone, metal, or silk as painting supports. The aim of my study is to clarify how paintings on special supports were invented and widely spread in sixteenth-century Europe. During my research stay at Trier University, I focused especially on the pioneering experiments with painting supports by the German Renaissance painter Albrecht Dürer. Trier, a border city between Germany and Luxembourg, was an ideal location for field research in Northern Europe. Moreover, I became acquainted with many talented researchers in the Social History of the Artist Research Center at Trier University. The professional network I developed there was the most valuable outcome of my stay.

Kayo Hirakawa, PhD *Associate Professor, Graduate School of Letters*
www.bun.kyoto-u.ac.jp/aesthetics_and_art_history/aah-wah_hiraka_en/

SOL-PHYS

Storms in Space

Exploring how the Sun governs "space weather."



Solar flares, the most energetic explosion in the solar system, are very spectacular, and they are accompanied by a variety of dynamic phenomena. They often affect environmental conditions of the Sun-Earth system and even the space surrounding the Earth, which cause intense geomagnetic storms at Earth. Therefore, understanding the current environmental conditions and forecasting the effects of disturbances as "space weather" are becoming more and more important.

I analyze various phenomena associated with solar flares, a crucial source of disturbances, by using a number of observed data to gain an overall understanding of flares, which may contribute greatly to the development of space weather researches.

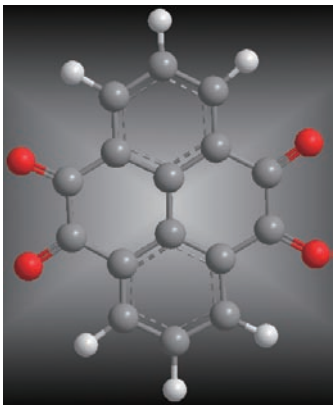
From the Editor By this achievement, Dr. Asai received the Young Scientists' Prize of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology this year.

Ayumi Asai, PhD *Associate Professor, Unit of Synergetic Studies for Space*
www.usss.kyoto-u.ac.jp/e/index-e.html

ORG-CHEM

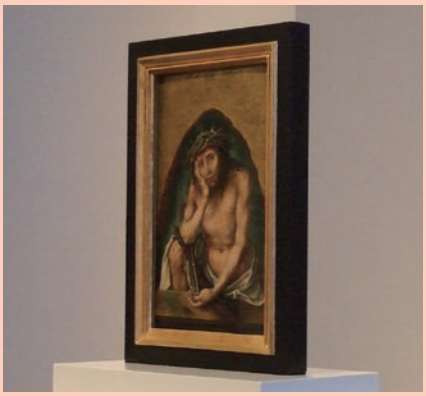
Organic Materials for Lithium-Ion Batteries

Promising candidates for sustainable and versatile energy storage.



Organic rechargeable batteries have received significant research interest from the viewpoints of structural diversity and sustainability. Prof. Yoshida and Assistant Prof. Shimizu designed core structures of organic cathode materials for lithium-ion (Li-ion) batteries based on molecular orbital calculations, which indicated that six-membered cyclic 1,2-diketones serve as excellent core structures because of favorable coordination of the oxygen atoms to Li and the aromaticity of the reduced form. The Li-ion batteries composed of pyrene-4,5,9,10-tetraone, which has two six-membered cyclic 1,2-diketone units, bound to polymethacrylate exhibit remarkable charge-discharge properties with a high specific capacity, excellent rechargeability (500 cycles), and fast charge-discharge ability.

Jun-ichi Yoshida, PhD (left)
Professor, Graduate School of Engineering
Akihiro Shimizu, PhD
Assistant Professor, Graduate School of Engineering
www.sbchem.kyoto-u.ac.jp/yoshida-lab/en/



Albrecht Dürer, *The Man of Sorrows*, ca. 1496, Staatliche Kunsthalle, Karlsruhe (photo: Dr. Kayo Hirakawa)

THE PROGRAM is named after the Japanese sailor, Nakahama Manjirō, also known in English as "John Mung." Rescued by an American whaler after a terrible shipwreck in 1841, Manjirō became the first Japanese to set foot on American soil. He enthusiastically learned about new technologies, laws, and customs. After he returned to Japan, he became a pioneering figure in developing the country's international relations. Inspired by his colorful life story, the program seeks to give junior faculty, staff members, and students opportunities to explore new academic and professional frontiers throughout the world.

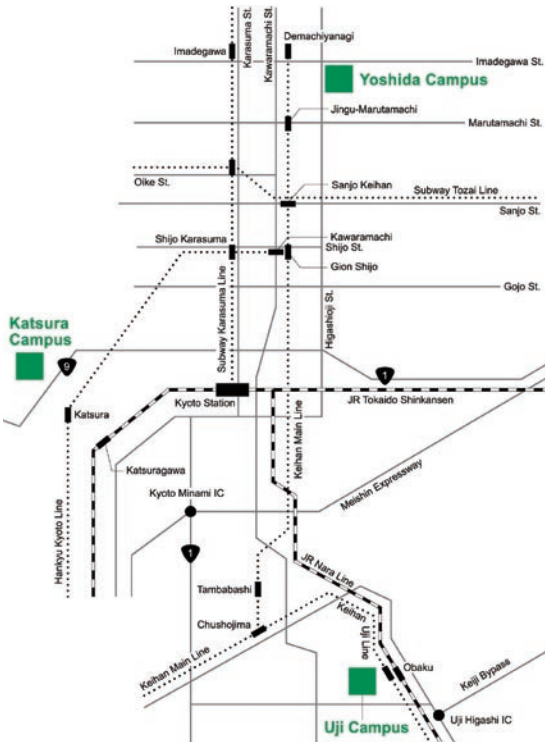
PHOTO: Wikipedia

Author Index

This information is also available online. WEB www.kyoto-u.ac.jp/ja/issue/research_activities

Map and Access

More information on how to visit Kyoto University can be found at the following WEB site;
www.kyoto-u.ac.jp/en/access



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