



# Kyushu University Ito Campus opens Center Zone

The brand new Center Zone includes the educational center for freshmen and sophomores called Center Zone Building I & II, a general gymnasium and extracurricular activity facility, a research and education building for graduate schools, a restaurant and other amenity facilities (Big Sand), and a dormitory (Dormitory II). Being the main entrance to the university, the Center Zone will receive visitors and students as the face of Kyushu University, which aims to prosper with the city and bring pride to its residents.

The letters of Kyushu University engraved on the plate at the gate were written by Koji Kakinuma, one of Japan's leading young calligraphers.



Kyushu University  
Campus Magazine

Kyudai News No.22



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# Setsuo Arikawa

■ The 22nd president of Kyushu University



Originally founded in 1911 as Kyushu Imperial University along with its College of Engineering, Kyushu University took its first step as the 4th imperial university by incorporating Fukuoka Medical College, a branch college of Kyoto Imperial University, which had been established in 1903. For over 100 years, the university has been conducting a variety of activities involving higher education, research and medical practice with its 11 undergraduate schools, 18 graduate schools, 17 graduate faculties, 3 research institutes and university hospital. Through our continuous efforts, Kyushu University has established itself as one of the leading core universities in Japan.

In 2011, Kyushu University will mark its centennial anniversary. Integration and relocation of our several campuses to the Ito area is currently underway, and we hope it will be a new "Center of Excellence" for the next 100 years, grounded in the numerous

achievements of our predecessors. We are building educational and research facilities on the Ito Campus with an eye toward offering citizens, as well as students and faculty members, intellectual everyday lives. Its aim is to be a modern campus open to citizens. The new campus will also serve as a demonstration site for next-generation technologies by presenting models of a near-future society with hydrogen energy, nanotechnology, personal authentication IC cards and more. We place priority on the preservation of greenery, water circulation, and the landscape, as well as archaeological sites, so that we can call it an oasis campus of nature and history, which will make it a unique and comprehensive base of research and education.

As a university open to the world, and based on our close historical and geographical connections with other Asian countries and regions, Kyushu University has been engaging in active academic

exchanges between universities and researchers, while accepting a number of international students. To mark our centennial anniversary, we are going to encourage more active international student exchange and receive a larger number of faculty members and researchers from foreign countries with our thorough support, for the purpose of creating an attractive educational and research base in Kyushu. By doing so, we intend to construct an open environment of education and research to the world. Along with such efforts, the International School of Arts and Sciences will be established, which will offer cross-departmental liberal arts education in English. Our ultimate goal is to be a world core university for research and education, representing Asia. This vision has been highly appreciated, and Kyushu University has been selected to be part of the Project for Establishing Core Universities for Internationalization (Global 30), which is promoted by the Ministry of Education, Culture, Sports, Science

and Technology. We are going to devote our energy to becoming an appealing university that will attract international students and researchers, and also enhance our functions as a world core university for research and education, representing Asia

Graduates of Kyushu University are succeeding all around the world. Dr. Koichi Wakata, a graduate of Kyushu University School of Engineering and an astronaut who successfully completed the long-term mission at the International Space Station in 2009, is one such example. Numerous excellent researchers are currently conducting research at the university, and with the aim of supporting these researchers, we have launched new systems and structures, such as the Distinguished Professor system and the Institute for Advanced Study. I sincerely hope that many of you will visit our campus, and that some of you will also study and develop research activities at Kyushu University.

# Homecoming lecture by astronaut Koichi Wakata

On November 24th (Tue.), 2009, a homecoming lecture was delivered by astronaut Koichi Wakata at the Ito Campus. Approximately 200 students and others involved with the university were present.

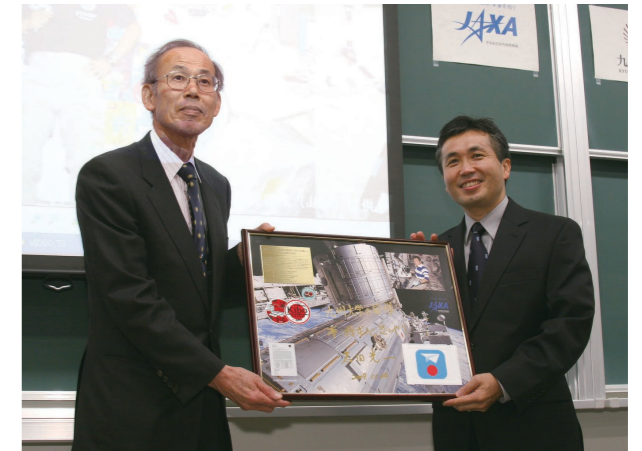


## Attendance at Kyushu University as part of a detailed blueprint to become an astronaut

Prior to the lecture, Dr. Wakata met with Yukitaka Murakami, the university trustee/vice president, at the Inamori Foundation Memorial Hall, and reported on the long-term mission of the International Space Station (ISS). At the end of the meeting, the university awarded Mr. Wakata the title of Visiting Professor.

Dr. Wakata was taught by Dr. Murakami when he was a student at Kyushu University, and this was the subject of the meeting that day. During that time, Dr. Murakami belonged to the Faculty of Engineering, Department of Mechanical Engineering, but he also lectured to students of Aerospace Engineering. Dr. Wakata studied material mechanics in 1984, elastic mechanics in '85 and material testing in '86 under Dr. Murakami. "Nine credits in all. I gave more credits to Dr. Wakata than any other teacher in the university. I contributed to his graduation," Dr. Murakami said.

From there, Dr. Wakata became interested in elastic mechanics and studied under the late Professor Seinosuke Sumi in graduate school. He completed his master's degree in 1989 and joined Japan

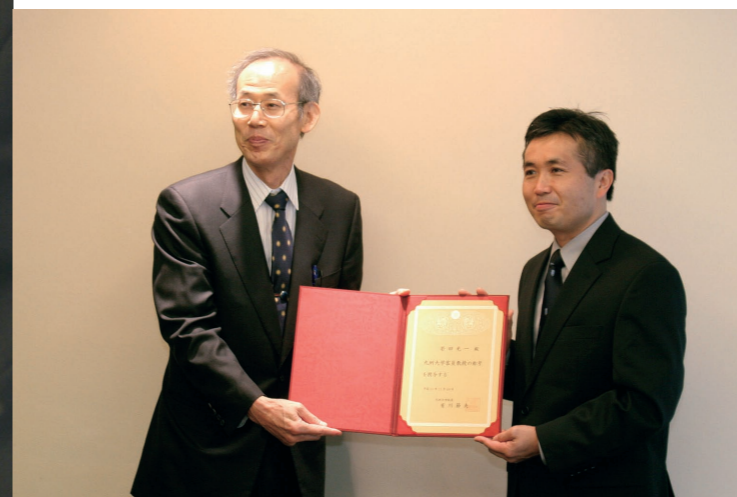


Airlines, where he was in charge of aircraft structural technology in the Systems Engineering Office, Engineering Department of the Maintenance Center in Narita. Only three years later, he was selected to be an astronaut. He was recruited to be an astronaut trainee by NASDA (National Space Development Agency of Japan) (now JAXA: Japan Aerospace Exploration Agency) for the assembly and operation of the ISS (International Space Station)/ Japanese Experiment Module "Kibo." The fact that he entered Kyushu University and then went on to graduate school seems to have formed a blueprint for him to become an astronaut.

Dr. Wakata cheerfully agrees, "I strongly feel that what I learned at university and graduate school was directly utilized when I worked in space."

## Japan's technology and teamwork condensed into "Kibo"

After the meeting, Dr. Wakata moved to Room 2307 in the second building of the center where students were waiting for his lecture. In this room, a transition ceremony was held to return a polo shirt with the Kyushu University logo that he wore as a part of his OFK (Official Flight Kit) during his long stay in space. The ceremony was followed by his homecoming lecture.



This polo shirt stayed in space for four and a half months with Dr. Wakata, and he was wearing it during live communication between Dr. Wakata and the students of Kyushu University in March 2009. He said that the space station smells like a factory, and the shirt still had that smell.

In his lecture, he used a DVD and Power Point presentation to explain how Kibo was assembled using robotic arms. He also discussed a variety of experiments (including materials experiments), presented beautiful and impressive images of earth taken from space and described what living on a space station with other astronauts is like.

The ISS is a project that was constructed and is operated in cooperation with 15 countries, including Japan. It is 110 meters wide and 75 meters long. It is large enough to hold a football field.



Dr. Wakata completed installing the external experiment facilities of Japanese Experiment Module “Kibo” on the ISS during his stay in space, which was the culmination of a 24 year process to complete Kibo. This is a great achievement not only for aerospace development in Japan, but for mankind as well.

In Kibo, various experiments and operations were conducted using a range of instruments. Experiments



included a crystal growth experiment, material experiments for the development of materials for efficient solar batteries, an experiment to estimate the effects of zero gravity on our consciousness in space, an experiment based on artistic themes and an experiment selected by the general public. Another experiment concerned new drug development for the new (H1N1) flu. Dr. Wakata reported, “By growing protein crystals using microgravity in the cultivation equipment on Kibo, we got very good results that should help lead to the development of specific agents.”

Starting with the early astronauts, Mamoru Mori and Takao Doi, there are currently six astronauts in Japan, including Koichi Wakata, Chiaki Mukai, Soichi Noguchi, Satoshi Furukawa, Naoko Yamazaki and Akihiko Hoshide. Candidates including Kimiya Yui, Takuya Onishi and Norishige Kanai are now undergoing training at NASA. Opportunities for Japanese astronauts seem to be greater than ever.

Dr. Wakata said that, after implementing various complicated missions, he realized how advanced the

Japanese technology condensed in Kibo is. He also said that Japanese ground controllers were excellent.

Students were inspired by Dr. Wakata’s impassioned lecture, and asked interesting and detailed questions. Questions ranged from philosophical questions to questions related to feelings and physical conditions in zero gravity:

“What is the meaning of space?”

“If I have poor eyesight or have a cavity, could I still become an astronaut?”

“Did you feel any sense of burnout or letdown after achieving such an important mission?”

Answering the question about the “meaning of space,” Dr. Wakata replied, “As a person who has experienced life in space, I think that reality is not only what we can see. There may be some sort of invisible existence. I feel that space gives us the ability to dream about such things forever. Humbly solving problems one by one based on an idea of what we don’t know, and activities to gain new insights could bring us



happiness and fulfillment.” He concluded by saying, “The time you spend here at school is very precious. Your classes are the key to improving your studies. Since professors prepare for each class taking at least three times as much as you do, you should listen to them carefully and make the class content completely your own. Take advantage of your acquired skills not only in space but every field, and try to establish international careers. Go for it together.”

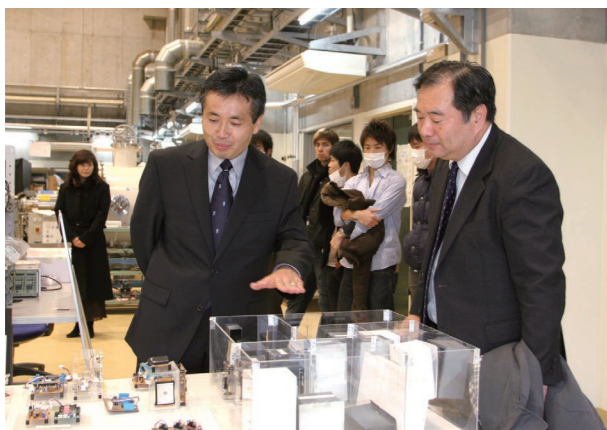
After the lecture, Noriko Ishii, a first year Master’s course student in the Graduate School of Engineering

who communicated live with Dr. Wakata in March, presented a bottle of Kyudai’s brand Imokyu, an authentic spirit made from sweet potatoes, to thank him for the lecture. The lecture was completed with applause from the students.

Since the lecture was transmitted simultaneously to the Hakozaki Campus and the Chikushi Campus using the distance lecture system, many students there could listen as well. This lecture was also transmitted to mobile devices by One Segment digital broadcasting.

## Dr. Wakata visits aeronautical engineering facilities

After finishing his lecture, Dr. Wakata walked around the Center Zone and visited the research facilities in the Center for Advanced Aerospace Engineering. He praised the facilities and said “this is an excellent place for the students of Kyushu University to study.”



Many junior fellows met him in the building and were able to pose for photographs with him. Dr. Wakata answered questions related to engineering from them respectfully and said, “As a visiting professor of this university, I am happy to talk about my experiences in space.”



# The Power of Dreams

-If you keep your dream alive, the dream will come true.-

**Yukitaka Murakami** | Trustee/Vice President

Do you have a dream? Not the dreams you have when you sleep, or those you may have in a classroom, but a dream you hope will be realized in the future.

Dr. Wakata often writes the words “Pursue Your Dream” on colored paper to present to children. The reason why he could become an astronaut is that he himself has been pursuing his own dream. Since dreams run fast, it is not easy to win a race to catch a dream. Why did he win the race? I realized the answer after some thought. I happened to be a part of the moment when he was a student. He pursued his dream enthusiastically and with a pure mind. He had the perseverance, innocence and cheer that characterize a person who is pursuing a dream.

### A strange question

In 1980, I was serving in a position at Northwestern University, located outside Chicago in the U.S., as a visiting professor for about 1 year. In connection with that, I was asked to act as host to the famous Professor Boley when he came to Fukuoka. Prof. Boley had been dean of the Faculty of Engineering for about 20 years. His visit was 20 years ago.

When he visited Fukuoka, Prof. Boley delivered a lecture in his field at Kyushu University, and then a social gathering was held at a hotel in Tenjin, Fukuoka in the evening. Six master’s students participated in that event, which was very rare. They were studying aerospace engineering in the laboratory of Prof. Seinosuke Sumi, the late professor of the Faculty of Engineering. It was Prof. Sumi’s generosity that allowed young students to participate in such a gathering, one that included a famous foreign professor. One of the students was a young

Koichi Wakata. He must have enjoyed the experience.

Prof. Boley came to Japan with his daughter who, unlike her father, was a specialist in classical Greek literature. I remember that she was a lecturer in language at a university. A day after the event, she said to me, “Yesterday, one student said something strange. He asked me very seriously what he had to do to become an astronaut.” She smiled and said, “I didn’t know how to respond.” I thought that the question was just another off the wall question, and the student just seemed to have asked the question to anyone. I only realized later that the student was Mr. Wakata.

### Supporting point of dream

I think this story pretty much typifies Dr. Wakata’s characteristics. He was an honest man, which was why he could ask such a question. He himself has pursued his own dream, and so he often says “pursue your dream” to others. If we keep our dreams alive, great things will happen. He shows us the truth of this by example. There are increasing numbers of young people who want to study at Kyushu University just because Dr. Wakata graduated from here. So his dream becomes part of a larger dream. He appropriately said in today’s homecoming lecture, “Classes are the key to improving your studies. Make the class content completely your own.” Time spent in class occupies most of a student’s life and is very precious. Do not attend a class without aim, but with keen interest. Pursue and achieve your own dream. We will give you our full support.

Reference: “How to Raise a Genius” (Asahi.com Education), by Dr. Wakata’s mother, is a good start to understanding more about Koichi Wakata.

# Kyushu University Leads the Social Business in Japan

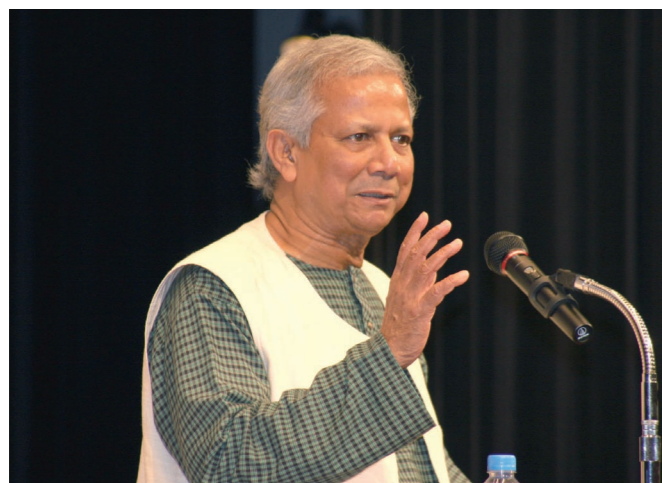
“Social Business,” is the word becoming more commonly used, which is a new model with business methods to solve various social problems, including poverty and environmental problems. Social Business has become famous by Prof. Muhammad Yunus, Nobel Peace Prize laureate in 2006, who has advocated and developed the concept of microcredit\* in Grameen Bank in Bangladesh.

In September 2009, Kyushu University signed the Memorandum of Understanding (MOU) for establishment of “Grameen Creative Lab @ Kyushu University” (GCL @ Kyushu University) and the “Grameen Technology Lab” (GTL) with Grameen Family and NTT (Nippon Telegraph and Telephone Corporation).

Masaharu Okada, professor of Intellectual Property Management Center of Kyushu University, talks about the projects.

**\* Microcredit**

Microcredit refers to very small loans made to unemployed people and entrepreneurs who do not have enough funds, or people who cannot get a loan from commercial banks because they are in poverty. 98% of such people is women.

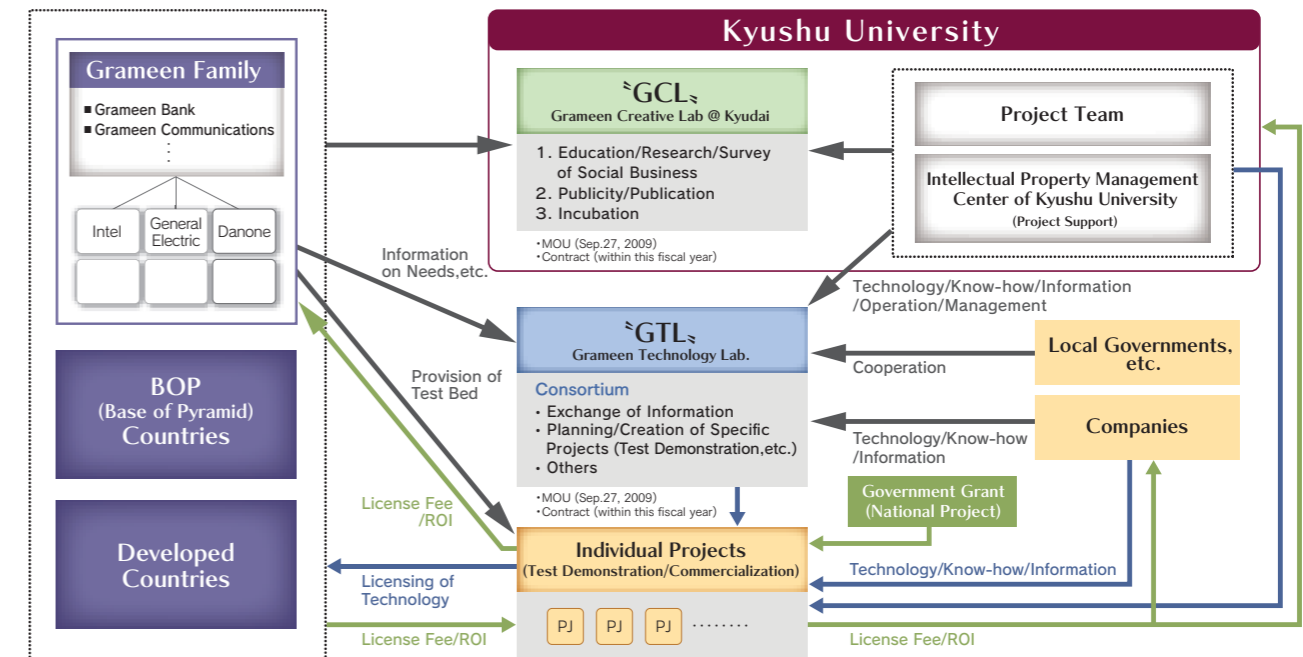


Prof. Muhammad Yunus



At the time of signing the MOU to establish GTL in September 2009

## Grameen Project Scheme



### ◆◆ Social business is “decent” business

Kyushu University has jointly developed IT infrastructures in developing countries, together with Grameen Communications on the basis of the collaborative agreement by and between both organizations in 2007

In August 2009, Kyushu University signed an agreement with the Japan External Trade Organization (JETRO) to work on “computerization of micro credit for the establishment of social infrastructure in Bangladesh” based on the know-how of our university and initiated a test demonstration in Bangladesh.

Both GCL @ Kyushu University and GTL are the laboratories to create those kinds of projects. Before explaining what GCL @ Kyushu University and GTL

are, it is necessary to explain briefly “social business” advocated by Prof. Yunus.

The concept of “social business” has mainly three elements. The first is a business that will resolve any social problems, including poverty, environment, education, energy and agriculture. The second is a business that will obtain “decent” profits. And the last is a business that will be self-sustainable. These elements, “problem solution,” “decent profits” and “sustainability,” are the key aspects to understand “social business.”

In order to solve any problems, it is necessary to understand actual situations and find solutions based on a direct hands-on approach. This practical viewpoint based on the front-line field is the standpoint of social business. Traditional business has been pursuing maximization of profits and enlargement, triggering the downfall represented by the “Lehman Shock.” On the other hand, according

to the basic concept of “social business,” each stakeholder gains decent profits despite zero-profit in principle and maintains a decent life to create a self-sustainable social model. The most famous example of “social business” is the microcredit of Grameen Bank. GCL @ Kyushu University is an international project which will promote research, education, publication and incubation on “social business” in cooperation with Grameen Family. GTL is the world’s first lab with corporations, governments and universities to tailor technologies for the needs in developing countries.

◆◆ **GCL @ Kyushu University as a hub in Japan**

The strategy to seek research, education, publication and incubation of “social business” involving universities is known as “GCL @ university.”

Originally, Grameen Creative Lab (headquartered in Frankfurt) was established by Mr. Hans Reitz, who had operated an advertising company. In 2007, he was captivated by a lecture of Dr. Yunus, establishing a joint venture, Grameen Creative Lab with the Grameen Family at his own expense. Since then, “GCL @ university” have been established in several countries including the University of Glasgow (U.K.), Bocconi University (Italy), McGill University (Canada) and California State University Channel Islands (U.S.). “GCL @ Kyushu University” is the second “GCL @ university” in Japan and its stance of efforts and structure have been highly praised by Prof. Yunus and Mr. Reitz. It will be highly expected that Kyushu University will take a leadership of development of GCL@university in Japan.

◆◆ **“Needs-oriented” is the key word of GTL**

What Prof. Yunus expects from companies and universities in Japan is technology, know-how, and experiments of products/services. GTL is an institution in which the Grameen Family, companies, local governments and Kyushu University cooperate and in which Japan’s technology is customized for local specifications based on the information of practical status, including social backgrounds, market, culture, and customs in Bangladesh. Previously, Japan’s basic philosophy of international contribution can be exemplified by bringing electric pumps to villages where electricity was not available. In contrast, what is now eagerly expected from GTL is that technology and products are to be developed/ customized based on the actual situations of developing countries. Currently, Kyushu University has been developing a number of unprecedented “needs-oriented” experiments; for example, a test demonstration of an IC card-type passbook (e-passbook) has been promoted for Bangladesh in cooperation with Sharp Corporation, and the project to support data distribution of villages by setting up personal computers that can be charged by photovoltaic generation in cooperation with NTT.

On November 7, 2009, the first Global Grameen Meeting (GGM) was held in Berlin, Germany, which brought together leaders of companies, government and universities across the world who have been inspired and involved in “social business.” I attended this meeting with Dr. Hiroto Yasuura, Executive Vice President of Kyushu University, and others and made a presentation about our efforts in Kyushu University.

◆◆ **“Karasu (crow) gane (finance)” (money lent at daily interest) in the Edo Era was a Japanese version of “My Crow Finance”**

The venue “Autostadt” was lined with Volkswagen laboratories and showrooms and seemed just like a theme park of the company. The site of the meeting on the company grounds was innovative; the floor for participants to sit on was surrounded by a stage (see accompanying picture). Also, each company and university made a presentation about its innovative efforts, and the meeting itself was very exciting.

One of the topics which I really wanted to refer in my presentation at the GGM was a business model called “karasu gane,” which was money lent at a daily interest rate implemented in Japan during the Edo Era (1603-1868). This type of business was to lend money to vendors, such as fish peddlers, when crows caw in the morning and to be paid back with interest when crows caw at the sun-set. So when I noted that there was “ ‘my crow (micro) finance” in Japan, the observation got a big laugh. Just as “karasu gane” represents, I think Japan has had a sense of equal distribution of wealth in society. It is now generally said in Japan that the age of “unequal society” has arrived. The salary of president is 1,000 times that of employees at the bottom within the same company in the U.S., while it is about 10 times in Japan. Japan meets the requirement of “social business” in a sense that employer does not make excess profits for themselves. Activities of pursuing profit-maximizing business and its expansion will face limits at some stages. The characteristics of

“social business” are self-sustainable, unlike in the case of NPOs/NGOs. In Japan, there are more than 3,000 companies which have been operating in business for more than 200 years, and 7 companies have been operating in business for more than 1,000 years. I think those numbers will represent the idea that our DNA is very suitable for “social business.”

◆◆ **The spread of “social business” to the world**

The leaders of world-wide companies, including Volkswagen, Danone (a food manufacturer), Veolia Water (a potable water manufacturer), and adidas, who have involved in the “social business” model with Grameen Family have participated in this meeting to exchange opinions and experiments. Through exchanging views with those participants and listening to their presentations, I strongly realized that now is the time when employers of Japanese companies have to decide to reset their for-profit minds. “Social business” might be given to the young generation in Japan as one of the choices for employment. Currently, developing countries have many problems to be solved, including poverty. While developed countries are in anxiety and chaos. This grand project has just begun to break through such a troubled modern age. GCL @ Kyushu University will propose and appeal how to solve problems through international collaboration with corporations, NPOs/NGOs and universities and will make efforts to achieve truly desired international and social contributions.



The venue of the first GGM and Prof. Okada presenting the efforts of Kyushu University



Prof. Yunus and Prof. Okada at the GGM



# New Outpatient Ward Opens at University Hospital

The New Outpatient Ward at Kyushu University Hospital was completed and opened on September 28, 2009.

The opening ceremony was held earlier, on September 11.

At the ceremony the Hospital Director, Chiharu Kubo, delivered an address, saying, "We designed this New Outpatient Ward to be bright, spacious and convenient. As a core hospital in Western Japan and part of the gateway to Asia, we would like to promote highly-advanced medical treatment, and to offer medical services that satisfy both patients and all of those engaged in medical care.

In addition to its role as a core hospital, the New Outpatient Ward will serve as a bridge to build a closer partnership with the local medical institutions and community.



## The New Outpatient Ward

The building has 5 floors above ground and 1 below.

Service functions are concentrated on the first floor, including a reception desk for first-time patients, an information, a revisiting patient reception, a guidance on hospitalization and medical tests, a cashier and a prescription counter.

A Block Reception System and a Block Waiting System have been implemented on each floor to improve medical safety and to reduce waiting time.

The Regenerative Dentistry and Implant Center have been newly established on the 4th floor. The Nuclear Medicine and PET Center in basement level 1 is equipped with two state-of-the-art PET-CT machines and four SPEC-CT machines, making it one of the national's most advanced medical facilities.



# HIGHLIGHT OF RECENT RESEARCH

KYUSHU UNIVERSITY

In 2009, the Nature journal and the Science Magazine introduced 7 research of Kyushu University.

## YOSHINORI FUKUI

Title  
Sequential regulation of DOCK2 dynamics by two phospholipids during neutrophil chemotaxis

Science Vol. 324, pp. 384-387 (17 April 2009)

### Summary of the Research



Neutrophils are highly motile leukocytes and play important roles in the innate immune response. During neutrophil chemotaxis, activation of the small GTPase Rac is spatially regulated to organize the extension of membrane protrusions in the direction of migration. This Rac activation is mediated by DOCK2, an atypical guanine nucleotide exchange factor, yet the mechanism controlling intracellular DOCK2 dynamics remains unknown. In this paper, we show that, while membrane translocation of DOCK2 is mediated by phosphatidylinositol 3,4,5-trisphosphate, subsequent accumulation of DOCK2 at the leading edge of the cell requires de novo synthesis of phosphatidic acid (PA). PA focuses DOCK2 localization through direct binding to DOCK2's C-terminal polybasic clusters, resulting in local induction of actin polymerization. When this interaction is blocked functionally or physically, neutrophils fail to form leading edges properly and exhibit defects in chemotaxis. Our results thus provide evidence that intracellular DOCK2 dynamics are sequentially regulated by distinct phospholipids to localize Rac activation during neutrophil chemotaxis.

Website <http://www.sciencemag.org/cgi/reprint/324/5925/384>  
<http://www.sciencemag.org/cgi/reprint/324/5925/346>

## KEIICHI I. NAKAYAMA

Title  
CHD8 suppresses p53-mediated apoptosis through histone H1 recruitment during early embryogenesis

Nature Cell Biology 11: 172-82, 2009.

### Summary of the Research



The chromodomain helicase DNA-binding (CHD) family of enzymes is thought to regulate gene expression, but their role in the regulation of specific genes has been unclear. Here we show that CHD8 is highly expressed during early embryogenesis and counteracts apoptosis mediated by the tumor suppressor protein p53. CHD8 was found to bind to p53 and to suppress its transactivation activity. CHD8 promoted the association of p53 and histone H1, with formation of the trimeric complex on chromatin being required for inhibition of p53-dependent transactivation and apoptosis. Depletion of CHD8 or histone H1 resulted in p53 activation and apoptosis. Furthermore, Chd8<sup>-/-</sup> mice die early during embryogenesis manifesting widespread apoptosis, whereas additional deletion of p53 ameliorated this developmental arrest. These observations reveal a new mode of p53 regulation mediated by CHD8, which may set a threshold for induction of apoptosis during early embryogenesis by counteracting p53 function through recruitment of histone H1.

Website <http://www.bioreg.kyushu-u.ac.jp/saibou/index.html>

## HIROSHI KITAGAWA

Title  
Size-controlled stabilisation of the superionic phase to room temperature in polymer-coated AgI nanoparticles

Nature Materials, 8, 476-480 (2009).

### Summary of the Research



Prof. Hiroshi Kitagawa (Kyushu Univ. & Kyoto Univ.) and the research group have succeeded in developing a solid electrolyte extremely ion-conductive even at room temperature and stable and heat-resistant in air for the first time in the world. The discovery of the new electrolyte will accelerate development for completely new, stable and high-performance solid rechargeable battery. Silver iodide (AgI) has long been known as a highly conductive solid substance (superionic conductor), and silver iodide in the superionic conduction state shows ionic conduction at a level similar to that of the electrolyte of lead storage battery (aqueous sulfuric acid solution), a typical automobile battery. However, these properties are obtained only at high temperature (147°C or higher), which is considered to be one of the obstacles toward commercialization. The research group has succeeded in developing it, by converting the raw material AgI into nanometer-sized particles by using nanotechnology. In this way, special AgI particles that can remain in the superionic conduction state even at a temperature close to room temperature were prepared. The substance has a superionic-conduction temperature lowest among traditional AgI-related substances. In addition, the substance is extremely stable in air and the performance of it remains unchanged even after repeated heating.

## ITSUSHI UNO

Title  
Asian dust transported one full circuit around the globe

Uno, I., K. Eguchi, K. Yumimoto, T. Takemura, A. Shimizu, M. Uematsu, Z. Liu, Z. Wang, Y. Hara & N. Sugimoto, Asian dust transported one full circuit around the globe, Nature Geoscience, Vol.2, No. 8, DOI:10.1038/NCEO0583, 2009.

### Summary of the Research



The transport of mineral dust is well known to occur usually within the lower troposphere. Long-range transport of Asian dust has occasionally been observed on a trans-Pacific scale, and, in a few cases, Asian dust has been detected in the ice and snow cores in Greenland and French Alpine. Here, we present findings from a comprehensive study of an extensive dust storm occurring in China's Taklimakan Desert during May 8-9, 2007. We found the dust veil-cloud was transported in the upper troposphere more than one full circuit around the globe. This extraordinarily long-range transport was tracked by the recently launched CALIOP lidar and confirmed by our model simulations. The dust transport took approximately 13 days, with an e-folding time of approximately 10 days. Upon reaching the northwestern Pacific after one circuit, the dust descended to the lower troposphere caused by the subsidence of a high-pressure system, indicating the possibility that Asian dust can supply mineral nutrients to open oceans far from the source region. During the transport, the dust appears to have interacted with cirrus clouds, suggesting that the Asian dust can impact the global radiation budget via indirect effects.

Website <http://www.nature.com/ngeo/journal/v2/n8/full/ngeo0583.html>

## MASAMITSU WADA

Title  
NINTH INTERNATIONAL PLANT MOLECULAR BIOLOGY  
CONGRESS, 25-30 OCTOBER 2009, ST. LOUIS, MISSOURI:  
Chloroplast Shuffle by Elizabeth Pennisi

Science Vol. 326, 20 Nov 2009 issue

### Summary of the Research



Chloroplasts move towards the area irradiated with weak light to absorb more light (accumulation response) and move away from strong light to avoid chloroplast photodamage (avoidance response). Both accumulation and avoidance responses of chloroplasts are important for plant survival. To avoid photodamage chloroplasts move more rapidly under stronger light. Chloroplasts can move to any direction by sliding, but not by rolling, without turn or rotation both in accumulation and avoidance responses. Chloroplasts do not have polarity, i.e. head and tail, for movement (Tsuboi et al. J Plant Research 2009). They can move back and forth without turn within a short period. These chloroplast behaviors could be explained by polymerization and depolymerization of "chloroplast actin filaments" that appear at the front half of the moving chloroplasts (Kadota et al. PNAS 2009). The chloroplast actin filaments exist between chloroplast and the plasma membrane. When chloroplasts stay stationary the actin filaments appear around chloroplast periphery and play a role in anchoring chloroplasts to the plasma membrane.

Website <http://wadalab.biology.kyushu-u.ac.jp/index.html>

## TATSURO ISHIBASHI

Title  
CCR3 is a target for age-related macular degeneration diagnosis and therapy.

Nature Vol. 460, pp. 225-230 (9 July 2009)

### Summary of the Research



Age-related macular degeneration (AMD), a leading cause of blindness worldwide, is as prevalent as cancer in industrialized nations. Most blindness in AMD results from invasion of the retina by choroidal neovascularisation (CNV). Here we show that the eosinophil/mast cell chemokine receptor CCR3 is specifically expressed in choroidal neovascular endothelial cells in humans with AMD, and that despite the expression of its ligands eotaxin-1, -2 and -3, neither eosinophils nor mast cells are present in human CNV. Genetic or pharmacological targeting of CCR3 or eotaxins inhibited injury-induced CNV in mice. CNV suppression by CCR3 blockade was due to direct inhibition of endothelial cell proliferation, and was uncoupled from inflammation because it occurred in mice lacking eosinophils or mast cells, and was independent of macrophage and neutrophil recruitment. CCR3 blockade was more effective at reducing CNV than vascular endothelial growth factorA (VEGF-A) neutralization, which is in clinical use at present, and, unlike VEGF-A blockade, is not toxic to the mouse retina. In vivo imaging with CCR3-targeting quantum dots located spontaneous CNV invisible to standard fluorescein angiography in mice before retinal invasion. CCR3 targeting might reduce vision loss due to AMD through early detection and therapeutic angioinhibition.

Website <http://www.nature.com/nature/journal/v460/n7252/full/nature08151.html>

## YOSHINORI NARUTA

Title  
Spectroscopic Characterization of a Hydroperoxo-Heme Intermediate  
of a Synthetic Model: Conversion of a Side-on Peroxy to an End-on  
Hydroperoxy Complex

Angew. Chem. Int. Ed., Vol. 48, pp. 9262-9267 (23 November 2009)

Nature Vol. 463, pp. 168-169 (14 January 2010) ; Angew. Chem. Int. Ed. Vol. 49, pp. 2099-2101 (15 March 2010)

### Summary of the Research



Dioxygen activation, which involves the reduction of an oxy complex and O-O bond heterolysis, is an important and ubiquitous process both in life and industry. Since O<sub>2</sub> reduction is a four-electron process, it usually gives so-called 'active oxygen species' (O<sub>2</sub><sup>-•</sup>, H<sub>2</sub>O<sub>2</sub>, •OH), which lead complex reaction products in oxidation reaction and decrease of the energy efficiency in its reduction to water. With use of a chemical model bearing a tethered imidazole ligand as heme enzyme active sites, we successfully and selectively prepared the corresponding hydroperoxy species (compound 0) through the proton-coupled electron transfer of the oxy species in a high purity, as works in heme enzymes. Furthermore, side-on peroxyFe(III) hemes are known to be inactive in its reactivity since its first report in 1980. The interconversion between side-on and end-on peroxy complexes is believed to be difficult for almost 30 years. However, we discovered its interconversion with use of the imidazole-tethered heme complexes. These finding is very important not only to know further insight into the enzyme reactions, but also to design proper molecular catalysts for oxygen reduction as well as the oxidation catalysts.

Joint Researchers Jin-Gang LIU, Takehiro OHTA, Satoru YAMAGUCHI, Takeshi OGURA, Satoshi SAKAMOTO, Yonezo MAEDA

Website <http://www3.interscience.wiley.com/cgi-bin/fulltext/122667704/PDFSTART>  
<http://www.nature.com/nature/journal/v463/n7278/full/463168a.html>

# G30 and Kyushu University's Globalization Project

In April 2009, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) launched the Global 30 (G30) Project in order to further promote the globalization of higher education in Japan, and to achieve the admission of more than 300,000 international students in Japanese universities by 2020.

To help achieve these objectives, MEXT has chosen 13 universities, both private and public, and provided each university with an annual grant of 200 to 400 million yen for the next five years. The recipient schools, including Kyushu University, are expected to build and improve a system whereby overseas students may study and engage in research with minimal cultural and linguistic barriers.

Here are some of the ways in which the University has been trying to globalize itself in line with the MEXT initiative.

- I. By April 2012, the University will have offered five undergraduate programs in agricultural science and engineering, as well as over 60 graduate programs in 17 of its 18 graduate schools, all taught exclusively in English.
- II. To improve its support system for international students, the University has established the International Student and Researcher Support Center. The center provides tutoring, a shuttle service from the airport upon arrival, and help in finding an apartment. The university will also offer academic support and assistance in finding jobs.
 

The International Student and Researcher Support Center  
<http://www.isc.kyushu-u.ac.jp/supportcenter-e/index.html>
- III. The university has opened an all-purpose office in Cairo, Egypt. Though the office was established and will be managed by Kyushu University, all other Japanese colleges and universities wishing to recruit students from Egypt, or to promote academic projects there, can have access to the office's services and facilities.

By implementing these measures, Kyushu University is hoping to raise its population of international students to 3,900 in next 10 years, a 300% increase over the current number. The university will also have laid the foundation for a new interdisciplinary department (tentatively called the International School of Arts and Sciences), which is expected to launch by 2020.

TOPICS

1

## “ASEAN in Today’s World” Launched

The opening ceremony of ASEAN in Today’s World (AsTW), an international education program that is being jointly conducted by Kyushu University and Mahidol University, was held at Mahidol University in Thailand on March 16, 2009.

AsTW is a three-week academic program developed by Kyushu University and Mahidol University at the urging of ASEAN Secretary General Surin Pitsuwan to launch academic programs among ASEAN countries. Students from seven ASEAN countries as well as Japan, Korea and China will study the diverse cultures of ASEAN countries and Japan, problems ASEAN is dealing with, health services, crisis management and more. By focusing on the ASEAN region, which has had an increasing impact on world politics and the global economy, the program is aimed at developing human resources who will play an international role as a bridge across Asia and to the next generation.



ASEAN Secretary-General delivers keynote speech



Students and executives of their universities

The AsTW program is introduced on the website of the ASEAN secretariat  
<http://www.asean.org/Bulletin-Mar-09.htm#Article-7>

The AsTW program website  
<http://www.isc.kyushu-u.ac.jp/astw/>

TOPICS

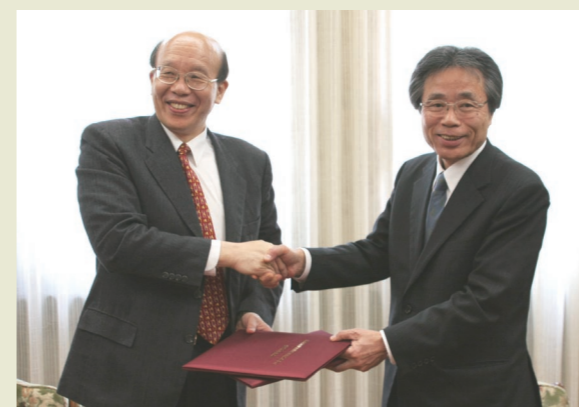
2

## Agreement for Academic Exchange Signed with National Taiwan University

A signing ceremony marking the conclusion of an Agreement for Academic Exchange with National Taiwan University was held on Tuesday, April 7, 2009.

Kyushu University and National Taiwan University signed a mutual memorandum on the exchange of students in April 2001. Based on the past results

of exchange between the two universities, the new agreement was brought to fruition after negotiations held during President Arikawa and Executive Vice President Suita's visit to Taiwan to attend the 7th Conference of Asian University Presidents and a ceremony marking the 80th anniversary of National Taiwan University.



**TOPICS**  
**3** Training Program at Thai Supreme Court Launched



Thai Supreme Court Secretary General Phinij Susaoraj (left) and Dean Masakazu Doi (right) shaking hands

On Thursday, July 2, 2009, the Kyushu University Graduate School of Law and the Thai Supreme Court signed a memorandum of understanding for a training program at the Thai Supreme Court. The training program, consisting of a one-year program in which Thai judges can obtain a Master's

degree in law and a four-month diploma course, will be included in the curriculum of the Graduate School of Law starting from the 2009 autumn term. The first four months of the Master's degree course and the entire diploma course will be held in Thailand.

**TOPICS**  
**4** Imojochu Imokyu Now Being Sold

(Imojochu : distilled spirit made of potatoes)

Imojochu "Imokyu" has now joined the lineup of Kyushu University's branded goods.

The commercialization of Imokyu is the result of a long-term joint research project between the Faculty of Agriculture of Kyushu University (Kensuke Furukawa, an emeritus professor, and others) and a liquor company. Imokyu is made with sweet potatoes to achieve a sweet and fruity scent and original flavor.

Presently, it is sold only at the university co-op but is scheduled to go on sale on the Internet soon.



**TOPICS**  
**5** Prof. Muhammad Yunus Visits the Ito Campus

On September 28, 2009, Kyushu University invited Prof. Muhammad Yunus, a 2006 Nobel Peace Prize laureate from Bangladesh and Managing Director of Grameen Bank, to the Ito Campus, where he held a seminar with students. This event was held to provide an opportunity for students to gain deeper knowledge and increase their interests by directly listening to one of the most prominent economists in the world. A student group called QITY planned and managed the event, and approximately 130 people participated.

In the panel discussion of the first session, Prof. Yunus and six panelists discussed the two themes of "Initiative by Grameen Bank, Social Business and World Economy" and "Prof. Yunus' Philosophy, Sense of Value and View of Life."

In the Q&A based second session, many questions came from the audience. Prof. Yunus answered each question in detail. At the end of the session, Prof. Yunus encouraged our students to believe in themselves and take action instead of thinking they were not good enough.



**TOPICS**  
**6** Kyushu University Inamori Foundation Center Opened

As a part of the Kyushu University Centennial Commemoration Project, the Kyushu University Inamori Foundation Center was constructed on the Ito Campus, made possible through a donation from the Inamori Foundation (Kazuo Inamori, President). It will serve as a core facility to promote education, and research, international exchange and local friendship. The completion ceremony was held on October 2, 2009. The Inamori Frontier Research Center, established at the Inamori Foundation Center, is a new kind of research center. It will pursue the ideals of science and



technology freely, as a base to nurture those people who will lead the world of the future and to develop the pioneering projects of coming generations. The center will be engaged in various activities aiming to lead in science and technology through the creation of new academic fields and future technologies.

**TOPICS**  
**7** **Kyushu University at Study in Japan Fair in Beijing**

On October 17 and 18, 2009, the Study in Japan Fair was held at the China World Exhibition Hall in Beijing. Kyushu University staffed a booth there and introduced the characteristics of its education and research, application procedures for studying at Kyushu University and other details. Approximately 500 schools from more than 30 countries around the world took part in this exhibition. A large number of Chinese students who hope to advance to higher education attended with their families. The venue was buzzing with excitement. More than 300 students visited our booth during the two-day period. Much of the attention it drew was a result of coverage in a local program broadcast on the internet.



**TOPICS**  
**8** **Itoh Research Center for Plasma Turbulence**

The Itoh Research Center for Plasma Turbulence was established by Kyushu University starting on October 1st 2009. The foundation of the center is associated with a project supported by Grant-in-Aid for Scientific Research, entitled 'Integrated Research on Dynamic Response and Transport in Turbulent Plasmas' (2009-2013). The principal investigator(PI) of the project, Professor S-I Itoh, Kyushu University, directs the center.

science, i.e., theory, simulation and experiment, in order to accomplish the scientific purpose of the project.

Corresponding to the methodological concept, the center consists of four major branches, i.e., branch of plasma turbulence theory and analysis, plasma turbulence simulation, plasma turbulence experiment, and plasma turbulence e-Science.

The center aims at forming an international core facility to develop methods to control burning plasma and to clarify the plasma nonlinear physics, including turbulent transport, structure formation and dynamo process, by systematizing the studies of plasma turbulence and by integrating research on non-equilibrium systems. Another emphasis of the center is placed upon the enhancement of international bidirectional education that has been already carried out at Kyushu University. These activities should make Kyushu University visible as an international carrier path.

The center should adopt, in particular, the methodology of e-Science, or integrating the major methodologies of



**TOPICS**  
**9** **Kyudai Philharmonic Orchestra Performed 100th Anniversary Concert**

The Kyudai Philharmonic Orchestra was founded in 1909 in the era of Fukuoka Medical College, the predecessor of Kyushu University. The 183rd semiannual concert commemorating its centennial anniversary was held in the ACROS Fukuoka symphony hall on November 23, 2009. The artistic large shoebox was filled to capacity of approximately 2000 seats. Arrivals just in time were forced to look round floor to floor for vacancies to the rise of the curtain. The Kyudai Philharmonic performed two

great symphonies composed by Rimsky-Korsakov and Dvorak as well as Academic Festival Overture written by the late Ryohei Hirose for Kyushu University. The symphony hall was finally filled with thunderous applause for the impassioned performance by students.

On November 25, two days after the concert, the Kyudai Philharmonic was honored by the Mayor of Fukuoka with an award in recognition of distinguished services in culture for many years.

