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Special Issue Faculty of Medicine

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KUToday is a biannual publication to present information about Kagoshima University to a wider international audience. Each edition will feature one faculty for prospective overseas students as well as other topics such as educational programmes, research and alumni information. Some articles are translations from the Japanese-language publication, *Kadai Journal*, upon which *KUToday* is loosely based. Any comments or suggestions about *KUToday* will be warmly received.

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A Note on Names
Following convention East Asian names appearing in *KU Today* are written family name followed by given name.



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Plaque to Dr. William Willis outside William Willis Hall



Special Issue

**Faculty of
Medicine**

ed. by Yatsushiro Rika

FROM LOCAL TO GLOBAL

— ACT LOCALLY, BUT THINK GLOBALLY —

The forerunner of the Faculty of Medicine was started originally as Satsuma-Han Medical School and Hospital in 1869. Dr. William Willis, a British doctor, was invited as the first principal in 1869. He lectured on western medical sciences to more than 400 students within 8 years. After that, the education of medical sciences in Kagoshima discontinued for almost 60 years. In 1943, Kagoshima Prefectural Medical Vocational School was authorized; this was the beginning of our current Faculty of Medicine.

The School of Health Sciences was started as the Nursing School affiliated to the faculty and became the College of Allied Medical Sciences in 1985, consisting of three courses, Nursing, Physical Therapy and Occupational Therapy. From 1998, the Faculty of Medicine has comprised of two schools, namely, the School of Medicine and the School of Health Sciences. Together with the Faculty of Dentistry located next to us, our Faculty of Medicine is now a hub for medicine and health sciences in southern Kyushu. In addition, because Kagoshima is situated at the southern tip of Japan, we have had many good opportunities to contribute to and collaborate with Korea, China, and other East-Asian countries in medical and healthcare fields.

Kagoshima has many islands that lie far south from the mainland and one-tenth of the population in Kagoshima Prefecture live on these 28 sub-tropical islands. The diseases peculiar to these islands have been studied widely. For the further contribution to this field, the Faculty of Medicine established the Department of International Island Medicine in 2001 which is the first department of its kind in the world. Every medical student must take this course and engage in a one-week practice on a remote island.

After the introduction of the primary medical training system in 2004, many young medical doctors



Dean Eizuru Yoshito, MD & PhD

move from rural areas to the big cities such as Tokyo, Osaka, Nagoya and Fukuoka, resulting in an imbalance in the distribution of medical doctors. In Kagoshima Prefecture, the number of medical trainees decreased profoundly, causing huge problems in the local medical system. To resolve this issue, we started accepting an extra 22 students per year, of which 20 are obliged to work for 9 years in public clinics or hospitals in communities in Kagoshima Prefecture after graduation. These students are all highly motivated to contribute to medicine in the local communities in the future.

Today Japanese society is symbolized by its ageing population and decreasing birthrate. This has led to individualistic feelings about the quality of human life. There is an increasing variety of methods required in social welfare, public health and medical practice. The number of old people's homes, rehabilitation centers, or the centers for those with dementia are increasing and require a lot of high-quality and skilled medical co-workers, such as nurses, public health nurses, and physical and occupational therapists.

The Faculty of Medicine cultivates highly qualified professionals and has made substantial contributions to the advancement of medical science and to the health and welfare of people across Japan over the years. Our mission is to foster personnel who are not only studious, but have mature characters, who can contribute to the local community, and who have an international perspective on medicine and healthcare.

School of Medicine

The six-year curriculum of School of Medicine is to train both medical practitioners and researchers who can contribute to future developments in the world of medicine. We focus not only on teaching medicine but also on preparing students for the national examination for medical practitioners which every graduate takes. From a practical viewpoint we make sure that our curriculum includes the necessary medical knowledge and skills to produce physicians of the highest standard for their patients and the local community as well as furnishing them with the compassion that every medical practitioner should have. Our educational goals can be seen in our syllabus, which we are constantly improving. From 2010 we started a new curriculum with more clinical practice and education about the sense of ethics and other qualities required for work in medicine.

From an academic point of view, we are required to introduce new medical knowledge and techniques. However we need insight to know whether those new ideas can produce results that will greatly benefit society. Centred around the Department of International Island and Community Medicine, all faculty students have to do clinical practice in island and rural communities, so that they can understand how vital doctors are in such places. Graduates also have the chance to learn about practicing medicine in island and rural communities through our postgraduate placement scheme which requires graduates to

spend a fixed amount of time working in Kagoshima Prefecture (Photo 1). Each year over 100 students graduate from our school to contribute to medicine in both in Kagoshima Prefecture and throughout Japan.

It is also our responsibility to further academic study to meet the medical needs of the general public. All of our staff makes constant efforts to improve research and education in their respective fields, whilst responding to the needs and hopes of the local medical community. In particular, the research being carried out in our Centre for Chronic Viral Diseases into the HTLV-1 virus, which causes cancer and nervous system-diseases, has been drawing attention from around the world.

In recent years we have started to address the issue of the lack of doctors in Japan, however there is also the need for us foster the next generation of highly-qualified medical researchers with a broad basis in science. That is why in an effort to develop the research minds of students, we have included a course in our new curriculum where students can take part in ongoing medical research by assigning 2nd and 3rd year students to research laboratories in every field in the hope that they will recognise the potential in becoming a medical researcher as well (Photo 2). This approach will contribute to the development of medicine and medical treatment in Japan, and its results are greatly anticipated.

(by Prof. Kawano Yoshifumi)



Photo 2



Photo 1



Undergraduate courses

Faculty of Medicine

- School of Medicine
- School of Health Sciences
 - Nursing
 - Physical Therapy
 - Occupational Therapy

Faculty of Dentistry*

*to be featured in Spring 2013 issue

Postgraduate courses

Graduate School of Medical and Dental Sciences*

- Masters in Medical Sciences *to be featured in Spring 2014 issue
- Doctorate in Health Research
- Doctorate in Advanced Therapeutics

Graduate School of Health Sciences

- Master of Science in Nursing
- Master of Health Sciences
- Doctor of Philosophy in Health Sciences

Miami Exchange Programme

The Faculty of Medicine has run an academic exchange programme with the University of Miami in Florida since November 1992. The University of Miami is a private research university established in 1925 with more than 15,000 students from all over the world. The medical centre of the university is Miller School of Medicine, Florida's largest medical school including three university-owned and three affiliated hospitals.

Under the programme, the University of Miami offers the opportunity to a couple of Kagoshima University medical students to study there for one year. The first students went to Miami in 1995. Since then, 45 students have studied there as of 2011. In Florida's pleasant surroundings, students from Kagoshima University learn medicine in the American education system such as PBL (problem-based learning) with students from many countries or regions. Studying abroad is also a good chance to experience foreign culture, a different way of life, and communication with many different people. The experience in Miami broadens their horizons socially as well as medically, which can be seen in their renewed motivation on returning to Kagoshima.

(by Prof. Kanekura Takurō)

Participant's Voice

Matsumoto Ryū, medical student

Hello! I'm Matsumoto Ryū, a sixth-grade medical student. It's my pleasure to tell you, how cool the Kagoshima-Miami exchange program is! We temporarily left Kagoshima University and spent a year in Miami, studying (of course!), drinking, travelling and making friends.

Why did we choose to go to Miami? We all have our "dreams", so I'm sure that everybody had different reasons. How about you? Do you want to improve your English skills? Travel through the US? Any reasons will be fine. You can do whatever you want. To know more about other countries helps you to have a better understanding about your own country. I'm happy to be someone who decided to do something for Japan, in particular, for Kagoshima!! I will be a doctor in the near future. My dream is to help many people here in Kagoshima. But we need to understand the world first, so I hope that you will also have a chance to visit Miami and share the special experience with everyone and anyone you meet.



University of Miami



Signpost for Kagoshima Boulevard in Miami

School of Health Sciences

Nursing



Fundamental Nursing

The role of our department is to introduce first year students to nursing and by the time they are in their final year to consolidate their knowledge of nursing. We value the scientific thinking of our students and provide a broad selection of subjects to support this so that they can understand the nursing metaparadigm of person, environment, health, and nursing.

Subjects which are consistent with the research areas of our department members are: Anatomy and Physiology, Pathology, Nursing Management and Nursing Ethics, Introduction to Nursing, Nursing Theory, Nursing Education, Fundamental Technique of Nursing Care, Nursing Diagnosis. We also provide stage-by-stage clinical practice for our 1st, 2nd and 3rd year students.



The motto of our department is 'think globally, act locally'. Accordingly, our research fields have a global outlook. Some department members have been to the

United States and South Korea to develop their research and collaborate with foreign researchers. Also we invited some researchers from those countries and shared academic and international time with students and faculties of other department. Our future task is to contribute to the development of nursing practice in Kagoshima with an international perspective. (by Prof. Yamaguchi Saori)

Clinical Nursing

The field of nursing is both practical and scientific looking for ways to help healthy people maintain and enhance their health and the sick to recover. We have four departments, (fundamental nursing, clinical nursing, maternal and child health nursing and community health nursing and nursing informatics).

In clinical nursing there are three areas, adult nursing, elderly people nursing and psychiatric and mental health nursing. Here are some of the main research topics of each area. In adult nursing, they look at dysphagia, palliative

care, cancer nursing, nurses views on life and death, improving the quality of life of gastroenterological cancer patients, the surgical care of biliary and pancreatic cancer, alternative medicines, cardiac ultrasonics in medicine, and cardiovascular nursing. For elderly people nursing, they look at the care of the elderly, rehabilitation nursing, and ageing. In area of psychiatric and mental health nursing research includes on patients and nurses psychology, patient-nurse relationships, and community support for people with mental disorder.

Apart from our varied research, we also conduct high level education both at the undergraduate and postgraduate levels. (by Prof. Shinchi Hiroyuki)

Maternal and Child Health Nursing

There are nine members of teaching staff in the department. One special feature of the midwifery course is that it produces 9 or 10 highly-acclaimed midwives every year. Research includes that of a problem particular to Kagoshima Prefecture, midwifery and mother and child health in the islands, and findings are often reported on at international conferences. In child health nursing, we aim to promote the subject amongst the students who on the whole have little exposure to children. Research includes looking at juvenile idiopathic arthritis and the quality of life of childhood cancer patients.

our education, we value our clinical training with lectures and training be attended by nursing staff from the paediatrics department of Kagoshima University Hospital.



(by Prof. Yoshidome Atsuko)

Community Health Nursing and Nursing Informatics

Embracing the university charter's motto of fostering a spirit of enterprise, our curriculum includes classes where students interview graduates who now work in the nursing profession as well as conducting fieldwork on islands so that they can learn about life there. Undergraduate and postgraduate classes are both offered on island health. We conduct research to find solutions to problems on both clinical and technical levels, as well as institutional and policy levels in order to establish a desirable system for the supply and demand of health care. In an effort to promote the development of island nursing, we have introduced training models and photovoice for diagnosis as well as researching the use of the health service. Interaction and joint research with the local community is increasing with health promotion strategies and local training. Currently more than 10 graduates are working as nurses or health visitors on the islands and the issue of their career-long education is most urgent.

(by Prof. Hatano Hiromichi)

Physical Therapy



Basic Physical Therapy

Physical therapy is rehabilitation medicine to treat those who have or may in the future have physical disabilities or difficulties in carrying out everyday tasks due to a reduction in physical activity.

To understand a person's mobility, we need knowledge of how the body works, the structure and function of joints and muscles and knowledge of the mechanics of gravity which of course affects us all. On this course, students learn about the body's mechanisms which form the basics of physical therapy, kinematics in order to be able to analyse everyday tasks such as getting up, standing up, and walking, and treatment to give pain relief and improved circulation using physical energy such as heat, electricity, water and light.

Research activities on the course include looking at the mechanism of movement in everyday life using 3D motion analysers and EMGs. We also conduct research on the function of the body using basic methods from anatomical science, biochemistry and physiology. Since there are limits on the research that can be done on the human body, we use animals in our fundamental research.

(by Prof. Sakakima Harutoshi)

Clinical Physical Therapy

In physical therapy to help the body recover maximum potential, there is exercise therapy to improve functions for problems with bones, muscles, the nervous, respiratory and cardiovascular systems, therapies using physical energy such as heat, light, ultrasound, electromagnetic waves and natural sources such as hot springs, as well as methods using prosthetic devices. We provide a high level of education offering a full range of clinical instruction including off-campus training. In particular, our training, which aims to improve the quality of health care workers, starts with early clinical practice in the first year, allowing the students to experience the clinical settings from the onset and recognise the role physical therapy plays, moving onto the clinical practice of physical therapy in the 2nd year, the practice of tests and measurements in the 3rd and finally physical therapy practice in the 4th year.

Research undertaken in the department centres on therapeutic exercise for bone and joint disorders, physical therapy for respiratory and cardiovascular diseases, physiopathological mechanisms and treatment of

cerebrovascular and neurological diseases and the approach of physical therapy for community health services.

(by Prof. Yoshimoto Yōichi)

Occupational Therapy



Basic Occupational Therapy

This department conducts research and education about occupational therapy for people with physical disabilities. Occupational therapy is carried out to support the lives of people by improving mobility and social adjustment.

Research topics include the analysis of people's everyday lives, the development of support methods for everyday activities, the use of the brain and nervous system for visual and audio cognition, human behavioural impediments, and the effects on lifestyles of reduced brain function with ageing. The department teaching staff comprises of one professor, two senior assistant professors and two assistant professors. The department trains the next generation of occupational therapists to have well-rounded characters and ethics to be able to provide support for people with physical disabilities. The department also provides masters and doctors courses to foster leaders who can contribute to the development of occupational therapy in the future scientifically, creatively and with interdisciplinary thinking. (by Prof. Iwase Yoshiaki)

Clinical Occupational Therapy

This department has two professors and two assistant professors. Research areas include the rehabilitation for the mentally disabled, interaction between motor action and cognition, rehabilitation for developmentally disabled children. Our recent research themes are the effects of psychoeducation for mentally disabled, community remedial education (day service for children) for developmentally disabled children and the correlation between the sensory characteristics of children with autism spectrum disorders and their social maturity. We also hold regular sessions for families of disabled people on different islands in Kagoshima Prefecture. (by Prof. Yanase Makoto)



Special Educational Courses

INTER-PROFESSIONAL EDUCATION

Matsunari Yūko, Department of Fundamental Nursing

In Japan, to provide patient-centric, safe, high quality health care it has become essential for a wide range of health care professionals to work together. However, at the education level, the reality is that there is little interaction. From 2012, in an attempt to overcome this problem, the School of Health Sciences has organised interdisciplinary subjects, known as Team Health Care, covering nursing, physical therapy and occupational therapy, which aim to give the knowledge and skills step-by-step over the four year courses. In Team Health Care I, students get to broaden their understanding in a clinical setting from an early stage and see how the different medical professions interact. In Team Health Care II, students are able to learn about the knowledge and skills necessary for interdisciplinary cooperation as well as learning about roles of fields other than their own. Finally in Team Health Care Training and Team Health Care III, students are able to become aware of their responsibility as a medical care practitioner by looking at the professional



Team Health Care lecture

approach taken in case studies, reflecting on their significance, which will hopefully motivate them to become proactive in their training.

ADVANCED PRACTICE COURSE FOR RADIOLOGICAL NURSING

Matsunari Yūko, Department of Fundamental Nursing

Japanese people live with the fear of effects on the health from radiation after the dropping of the atomic bombs on Hiroshima and Nagasaki in 1945 and today, too, with the Fukushima nuclear power station accident. On the other hand though, radiotherapy, the minimally invasive procedures of interventional radiology (IVR) and RI are popular. In view of this, the role of nurses in this area is large, however currently training is insufficient. For this reason, the Graduate School of Health Sciences started its Advanced Practice Course for Radiological Nursing in 2012 with its first two students. This course will specialise in the knowledge and skills of radiotherapy, IVR diagnosis, radiation emergency medicine. We hope to be able to produce graduates who will be able to work as highly-skilled professionals ensuring that patients receive the best possible treatment both safely and comfortably.

International Activities

KAGOSHIMA INTERNATIONAL NURSING FORUM

Yatsushiro Rika, Department of Fundamental Nursing

As part of its contribution to the local community, the School of Health Sciences has held the Kagoshima International Nursing Forum twice, with the goal of giving nurses in Kagoshima the opportunity to think globally and act locally. For the first forum, we invited Dr. Elizabeth Madigan from Case Western Reserve University in Ohio, USA to discuss with nurses working in many different



situations the role of nurses in collaboration between the hospital and community. The second forum, Nursing Ethics – toward the Best Nursing Care for Patients, was held in conjunction with Kagoshima University Hospital. The speakers were Dr. Anne J. Davis, professor emeritus of University of California, San Francisco, Dr. Um Young-Rhan, professor in the nursing department, College of Medicine, Soonchunhyang University, Korea and Dr. Konishi Emiko, professor of Saku University's School of Nursing in Japan. The forums have been attended by over 200 current nursing staff, teaching staff in nursing schools, and students from all over Japan.

VISIT TO COMMUNITY HEALTH CLINICS AND CHUNG-ANG UNIVERSITY IN KOREA

Yatsushiro Rika, Department of Fundamental Nursing

As stated in its charter, the university aims to produce graduates who, with a spirit of enterprise, can contribute to society and be active in the international community. To

this end grants are offered to enable students to take part in overseas study tours. In 2011, the nursing department was able to get funding for a 5-day trip to two community health clinics and also the College of Nursing at Chung-Ang University in Korea.

As part of their final semester studies, 4th year nursing students are required to do group works. One of the topics was nursing systems in Asia, and so four students went to study the nursing system in Korea, which had created undergraduate and postgraduate nursing courses long before Japan. For their dissertations, students also studied about the community health practitioner system as well as primary health care in Korea.



After the reception in Chung-Ang University Hospital



Home visit with a Community Health Practitioner

International Research Projects

DEVELOPMENT OF A CONTINUAL EDUCATION SUPPORT SYSTEM FOR NURSES ON ISLANDS WITH NO DOCTORS

Yatsushiro Rika, Department of Fundamental Nursing

We received a Science Research Grant (B) for our research into health care on isolated islands and in remote areas. On the islands where it is impractical to have a doctor, the nurse is the only resident health care professional and they are highly-valued by the island communities. To enable island inhabitants to live healthily for as long as possible in their homes, it is necessary to increase the power of the local nurse to its full capacity, and for that our research looks at the education and training support system needs to be put in place. Joint researchers on the project are Dr. So Woo Lee, professor emeritus of Seoul National University, and Dr. Anne J. Davis, professor emeritus of the University of California, San Francisco. Dr. Davis spent one month in Kagoshima in October 2011 on a JSPS Invitation Fellowship Programme.

Until last year we carried out observations and interviews with the five nurses on the five islands with no

doctor in Kagoshima Prefecture, as well as two community health practitioners from Korea and one nurse practitioner from the USA which both have a more advanced national system for nursing than Japan. We also studied the nursing in Nagasaki Prefecture, which like Kagoshima Prefecture, also has many islands and remote communities.

THERAPY DEVELOPMENT AND REHABILITATION EFFECTS FOR NEUROMOTOR DISORDERS AT THE CELLULAR AND MOLECULAR LEVEL.

Sakakima Harutoshi, Department of Basic Physical Therapy

Just as evidence based medicine (EBM) is important in the world of medicine, evidence based physical therapy is in the field of physical therapy. By analysing the effects of rehabilitation at the cellular and molecular levels, presenting the evidence, we are hoping to develop an effective treatment method. We are investigating breakthroughs in pathological conditions using nerve disorder (stroke, spinal cord injury, Alzheimer's disease) model animals and the effects and mechanisms of improvement in function through exercise intervention post-disorder. We are also looking at similar effects using motor disorder (skeletal muscle injury, disuse muscle atrophy, joint contracture) model animals. This research is currently being conducted together with a group under Dr. Singh of the Department of Neurodevelopment at the Medical University of South Carolina.



Research associate Yamaguchi Saori, visited Ashtabula in Ohio, USA for the project and was featured in the local newspaper.



Health Clinic in the Takara Islands



Kagoshima University research team



Medical University of South Carolina research team

Student Voices



Chung Sang Hyun
(Korea)
medical student

Kagoshima, the location of Kagoshima University, has an active volcano called Sakurajima and is thus blessed by natural surroundings not often found in big cities. The Faculty of Medicine possesses an

international outlook and actively integrates foreign students. Furthermore there is a lot of support for foreign students which allows them to study and do research in a good environment. Since I have entered the university, I am leading a pleasant lifestyle, whilst simultaneously cooperating with Japanese people. I have quickly become a part of the laboratory and I am able to do in-depth, thorough research on topics I like. But it is not only about studying, I am also taking part in club activities: doing sports, communicating with many different people and learning to understand each other also encouraged my personal development. Being able to study here together with such great instructors and students makes me feel that I am really lucky.



Ho Thi Ha
(Vietnam)
BSc student in Occupational therapy

I am currently a 3rd year student in occupational therapy in the School of Health Sciences. Before I came to Kagoshima, I studied Japanese at Shizuoka Japanese Language Education Centre. Of the five years I have spent in

Japan, just over two have been in Kagoshima. The volcanic ash in Kagoshima is incredible!! But the people here are even more so. Everyone is so warm and friendly. Kagoshima has really become my second home. Wherever I end up in the future, I will never forget Kagoshima. I am the only foreign student on my course, which was a bit discouraging at first, but my professors are so kind and my classmates so friendly, that I soon got used to everything. I only have one and a half years left until I graduate. By then I hope to continue studying hard, learning skills and also make lots of good memories in Kagoshima. After that I hope to put everything I have learnt in Kagoshima to good use as an occupational therapist in Vietnam.

Hiroshi Casanova
(Peru)
medical student

Hello everyone! Since I was a child, I have been greatly influenced by my father who is a doctor and tries to do the best he can for his patients. Also, I was influenced by the works of professors Watson and Crick. I still believe in the presence of quantum mechanics working alongside the DNA model proposed by the Nobel prize winners. Life on the university campus is really enlightening. I had the opportunity to study in the laboratories of biochemistry and physiology, which gave me a global inside into basic medicine. Hoping you also find a place where you can develop your fully potential at Kagoshima University.



Zang Yuanyuan
(China)
MSc student in Nursing

Originally from Dalian in China, I am now a 2nd year postgraduate student in the Graduate School of Health Sciences. I arrived in Kagoshima full of dreams and enthusiasm in the spring of 2010. Going to studying abroad on your own is not easy, I have learnt a lot. The most important thing has been time management. Being a postgraduate student you have much more freedom than undergraduates. Deciding what to when, and planning what to do first, next and last is really important. With the help of my professors and seniors I have really learnt how to organise myself.

My research topic is the awareness of nursing techniques amongst nurses fresh out of university in China and Japan. In my first year, I spent a lot of time reading the literature and discussing with my supervisor before I chose what I wanted to research. Of course being an overseas student isn't all about studying. I also have lots of fun going to the aquarium with my Japanese friends or cooking with friends in the dormitory. I hope to continue enjoying my time here as I work towards finishing my master's dissertation.



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University Botanical Gardens

A Wooded Field Museum

Endemic species from the Nansei Islands



Rhododendron Scabrum



Alangium premnifolium



Lagerstroemia Subcostata var. fauriei



A 1935 photograph showing the flower-beds of the gardens tidied in preparation for a visit by Emperor Hirohito.

Kagoshima University's botanical gardens are located in the centre of the main Kōrimoto campus. When you enter the main gates of the university, just proceed to the left and there you will find the entrance.

The plans for the botanical gardens were conceived by the first principal, Tamari Kizō, of the then Kagoshima College of Agriculture and Forestry (which preceded today's Faculty of Agriculture), to mark the opening of the school in 1908. They were completed some 10 years later in 1919, to include a hectare of classified flowerbeds, and since this time the botanical gardens have transformed over their 88 year long history.

During the long history of the gardens, the most dramatic event was undoubtedly when the gardens were almost completely destroyed by fire from air raids during the Second World War. Shortly after the war ended, however, students and staff worked tirelessly to restore the gardens to their former glory. Above all, the biggest development in the history of the gardens came with the inauguration of Kagoshima University in 1949. Under the guide of Professor Hatsushima Sumihiko (Professor Emeritus of Kagoshima University) and Associate Professor Sako Shizuo from the then Faculty of Agriculture's department of forestry and silviculture, specimens of indigenous trees from the southwest islands were collected, planted and maintained here, and it is this collection that remains as the unique feature of the botanical gardens today.

Today the gardens are home to flora unique to southern Kyūshū, the Nansei islands and also many non-indigenous varieties such as north-American trees planted prior to the Second World War, and this provides an ideal place for undergraduate and graduate school students to undertake practical field research. The garden's rich variety of botanical species attracts many types of migratory birds, while nearby residents enjoy this leafy environment as a place for taking peaceful walks and observing nature.

Last year, during the annual university festival student volunteers organized a walk rally through the gardens for visitors to the university, and this proved very popular with all of the participants. Plans for the future include the supplementary planting of indigenous tree species that may be endangered or lost due to typhoons and so on, while maintenance of the gardens will be further improved. With the botanical gardens as the key focus, it is the aim of the university to develop a detailed network of all the notable trees featured across all of the campuses with the hope of providing high quality and a broad variety of species for research and study. We warmly welcome all visitors to our 'field museum in the city', the Kagoshima University Botanical Gardens.



Developing a breeding scheme for new colour varieties of eustoma flowers



Students weeding the beds in the university greenhouses. All the flowers used for research are grown at the university.

Development of the rule governing multiple allelism and the method of crossing flower colour genotypes

This is where Professor Hashimoto pinpointed that the colours of eustomas were determined by the rule governing multiple allelism, which is in simple terms the same as our blood types. In the same way that we can determine a child's blood type if we know that of the parents, it is also possible to know what colour a eustoma is going to be. By knowing which genotype is controlling the colour, you know which parent flowers to hybridise in order to make the desired colour."

The research included measuring and digitalising the colours of every flower were measured using a colorimeter, as well as checking the type of pigment and its proportion in the epidermal cells of the petals. So far, over 30,000 eustomas have been analysed. This led Professor Hashimoto to ascertain that there are two things that govern flower colour: the type and proportion of pigment in the petals, and at least 5 genotypes that are necessary to biosynthesise the pigment. "Knowing the data of the colour I want, the pigment, and 3 genotypes for the biosynthesis enables me to decide which parent flowers are needed to produce the colour I want. Then by hybridizing the chosen parent flowers, I am pretty much 100% successful in producing the colour I am after," says Professor Hashimoto, who has named the process, the method of crossing flower colour genotypes.

He has also done research into the shape and pattern of petals and he discovered that Mendelian inheritance also applies to them. In this way, it has now become possible to effectively engineer flower colour, petal

Hashimoto Fumio, an associate professor in the Faculty of Agriculture, has been researching ways to create new colours in eustoma flowers. He firstly discovered a rule for multiple allelism, and then based on that he has developed his method of crossing flower colour genotypes. In this article, we look at the techniques behind freely controlling flower colour.

Cut flowers in all their different shapes and colours brighten up our everyday lives. If only we could freely create the colours we wanted ...

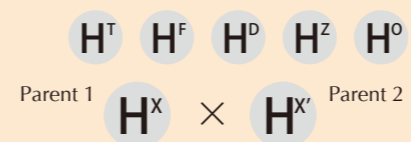
Well, Hashimoto Fumio, an associate professor in the Faculty of Agriculture, has been researching new methods for developing flower colours. Plant breeding refers to the changing of a plant's genetic properties to produce new cultivars. Professor Hashimoto has been working with eustoma flowers (*Eustoma grandiflorum*), members of the Gentianaceae family, to create new colour varieties. Eustomas, native to America's southwest, like hot, sunny climates. In Japan's cut flower industry, which is said to number 6 billion flowers a year, the eustomas come in 5th most popular after chrysanthemums, carnations, roses and lilies. The original flower was purple, but domesticated cultivars come in pinks, whites, creams, lilacs, and reds; and their popularity stems from being used a substitute for roses and chrysanthemums.

Mendel's law and flower colour genes

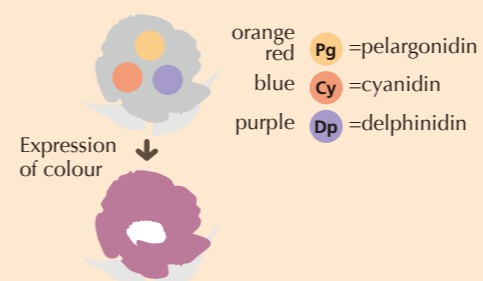
It had been given that the colour of flowers was genetic and determined by the laws of Mendelian inheritance. When Professor Hashimoto first started his research, he also very naively thought that if he was to take a certain colour flower and hybridise it with another he could create the colour he was after. "When I self-propagated red flowers, I quite simply thought I would get 75% red and 25% white. However the results were much more startling." A whole variety of colours were produced. "This really sparked my interest. I furiously started making notes about everything and some nights I couldn't sleep for thinking about the genetics behind flower colour."

Mechanism for the expression of colour in eustomas

5 genotypes related to the biosynthesis of flower pigmentation



Pigmentation and its proportion depends on the genotypes of the parent flowers



shape and pattern to follow the needs of the market. Kagoshima Technology Licensing Organisation (which operates out of Kagoshima University to aid the transfer of research results to the private sector) has already acquired the patent for the method of crossing flower colour genotypes for Japan, China and New Zealand, and is hoping to get patents in the Netherlands and the United States, too.

Making the multiple allelism rule universal

Until now it had been impossible to know what colour flower you would get until it bloomed and the development of new cultivars had taken about 5 years. However using the method of crossing flower colour genotypes with eustomas, not only is the colour definite, but the time frame needed to produce new colours has been reduced to a year or even less if the plants are forced. Trials have already taken place in partnership with Japan Organic Company in Soo, Kagoshima Prefecture with positive results, so much so that the company has started full-scale production.

Professor Hashimoto says that his next quest is to see what other species of flower the multiple allelism rule applies to. "I have already found that it works for azaleas and sweet-peas. It couldn't make me happier if many different places were to use this method, and we could find out whether the rule is universal for all the colours of all flowers." He has also been researching polyphenols in green tea and has discovered over 70 different chemical structures. "There is still so much we don't know about the polyphenols in green tea, and so many different things I would like to look into."



Dr. Hashimoto Fumio

Associate professor, department of Agricultural Sciences and Natural Resources, Faculty of Agriculture. Born in Fukuoka Prefecture in 1959. 1988 PhD from the Graduate School of Pharmaceutical Sciences, Kyūshū University. From 1988-1991 researcher for Ōtsuka Pharmaceutical. 1991-1997 Assistant professor at the pharmaceutical botanical garden of the School of Pharmacy of Kumamoto University. 1993-94, research under Lee Kuohsiung in the School of Pharmacy of the University of North Carolina at Chapel Hill. Developed the anti-HIV drug DMSB. Has been a member of staff of Kagoshima University since 1997, becoming associate professor in 2007. Specialist field is floriculture and chemistry of natural products. In 2005 awarded the prize for best article by the Japanese Society for Horticultural Science.

Eustomas produced using Professor Hashimoto's method





Manga Society

Otsuda Ryōta, BA student,
Faculty of Law, Economics,
and Humanity

As the name suggests, our society is for people who love reading and drawing manga. We bring in the manga we like, read them together, talk about them, and then use ideas from them when we draw our own.

When it comes to drawing manga, we are constantly trying to improve our artistic skills and trying to create even better pieces by showing off what we have drawn and giving each other advice throughout the drawing process on storylines, naming, and drafting. In actual fact, it's not easy to draw a good manga straightaway. But that is good. Producing something that is not coloured in properly, that has scruffy frames, or that has a difficult to understand plot, helps us notice many things. And from there we can go back over what we have done and improve it little by little to produce a really good final version.

And even if you are no good at drawing, you can still create manga. Even though the pictures are an important part, so too are how to divide up the frames, how to use the speech bubbles, writing the dialogue, choosing the font styles and size as well as the onomatopoeia. It is possible to make a really good manga without being able to draw well. And everyone gets better at drawing the more you practice. In fact, many of our new members have never drawn before.

However, the manga society is not just about drawing manga. Twice a year, in June and November, we hold exhibitions of our work at the university. This gives us a chance to show off the illustrations we have been drawing during the year, as well as sell our manga



magazine, TOMCAT. This year our theme has been myths. The photograph shows pictures of our illustrations of some of the gods that appear in Japanese legends. The exhibitions help us improve both our style and skills, but also give us the chance to have people outside the society see our work.

Compared to a normal piece of literature, manga allow the reader to jump straight into the author's view of the world with their pictures. And unlike TV or films, manga can be dynamic with flashy action sequences, which is why they are popular with young people. The power of manga is also enormous. *Eyeshield 21*, a manga about American football that appeared in the weekly anthology *Shōnen Jump*, published by one of the biggest manga publishing companies, *Shūeisha*, became extremely popular and that led to an increase in the number of high school students taking up the sport. There are also people who have become robot scientists because they read *Astro Boy* or who have gone into medicine because they had read *Black Jack*, both by the "God of Manga", Tezuka Osamu. And even though the manga we draw are not going to change anyone's life, we try at least to appeal to people's emotions with them.

So if reading this has sparked an interest in manga in you, I would advise you to read lots, laugh at them, cry at them and enjoy them. And if you think you would like to try your hand at drawing some, all you need is pencil and paper, and some passion. Why not join us and make manga a part of your life, too?



The Karaimo Kōryū Homestay Programme

— grassroots international exchanges



The word *karaimo* refers to the sweet potato (lit. China potato), which was introduced into Kagoshima from China in the 17th century. After the Second World War, the Japanese found themselves short of food but they were able to fend off starvation by eating sweet potatoes. For Kagoshima people, the *karaimo* is a symbol not only of cultural exchange but also how Kagoshima became enriched by something from overseas.

The Karaimo Kōryū homestay programme for foreign students was started in Kagoshima in 1981. At that time having homestays in agricultural villages for the international students studying in the big cities to experience the rural lives and culture of Japan was a really challenging and innovative idea. In 1985, the programme developed into a movement for international cooperation called Karamosia (a portmanteau of *karaimo* and Asia). Many Kagoshima University students and staff have since taken part in Karamosia's activities in poverty alleviation, environmental conservation, and the eradication of poppy cultivation in Myanmar, Thailand and China.

Presently, Kagoshima University offers students study tours to those countries and the NPO Karaimo Kōryū organises homestay programmes, which have spread to 20 municipalities in Kagoshima and Miyazaki prefectures with 4,196 students from 80 different countries and territories having taken part to date.

The two-week homestay programmes are held twice a year. In spring, exchange students already in Japan take part, while the summer programme is for students studying overseas. The programmes centre on interaction with the host families, the local community and schools as well as taking part in work experience. Through helping the host families with their work, the programme hopes that all participants, students and host families alike, will learn more about each other and hopefully develop lifelong friendships, something which you cannot get from a normal holiday. Every homestay placement is different and host families can be involved in all manner of jobs from agriculture to running shops, from being office workers to running temples.

What does the programme entail?

All of the exchange on the programme takes place in our daily lives.

1. In homes: Participants are treated as members of the family, and you are expected to pitch in with housework or cook food from their home countries.
2. In the workplace: Participants help the host family in whatever kind of work they do, be it on the farm or in a shop. Many also help out in local old people's homes too. No matter where you are placed, you can be sure you will

be busy.

3. In the local community: Participants have plenty of opportunity to take part in local events, sports days or give cooking classes.
4. In local schools: Participants will be invited to the schools in their homestay area to give classes on your language or country's culture, teach songs or games, or just show your traditional dress.

For further information:

Email: karaimo@po.synapse.ne.jp

URL: www5.synapse.ne.jp/karaimo/

Previous participants' reactions

● Students

My host mother treated me just like one of her own children. To pay them back for the warmth I received, I hope to become a respectable member of society. I want to learn about tea culture in China and tell my host mother about it. And for my host grandmother with her bad knees, I want to find some good Chinese medicine. I hope that will be able to extend the same kind of warmth to people in the future that I found on the programme.

These two weeks were a lot of fun and really worthwhile. Doing something different gives you the opportunity to learn something new about yourself: I now love relaxing in the bath; all the weeding was ok, but I don't want to see another worm; and not being able to hear the stray cats miaowing makes me feel sad. Those were some happy days.

● Host families

It was good to hear the students say that they were experiencing many things for the first time. It would be a real shame if they went back to their home countries only having spent time in big cities like Tōkyō and Ōsaka. They have to come and see how we live in the country.

I was really impressed that they all have a clear idea about what they want to do in the future – that's quite different to young Japanese people. We have fun together every day. My elderly parents couldn't let go of one student because they were so kind and thoughtful, just like a grandchild.





KU Volunteers for the 3/11 Earthquakes and Tsunami

By Nakatani Sumie, Centre for International Planning

The huge earthquake and tsunami that struck Northern Japan horrified the whole of the country. Even here in Kagoshima, some 1000-1500km from the stricken area, many were deeply distressed and felt that they wanted to do something to help. In this article, we will look at some of the relief work undertaken by the university and students.

Immediately after the disaster happened, the university president set up a relief centre at the university, which oversaw amongst others the sending of university hospital doctors to the stricken areas, the deployment of the Faculty of Fisheries training vessel, the Kagoshima-maru, to deliver emergency aid, the organisation of a relief fund and the collection of used computers to be sent. As of June 2012, the university hospital had sent more than 100 members of staff. The university relief fund has so far collected 17 million yen. The total 60 students and several teaching staff have also

taken part in volunteer work in the area as well as conducting research surveys there.



The university's foreign students also played their part. KUFSA (the foreign students' association) started the Kagoshima International Relief Programme (KIRP) and collected money out on the streets of Kagoshima. Also some of the proceeds from different international events, such as the international food festivals in the cafeteria, the international futsal competition, and the students' main cultural event, International Night, went towards disaster relief. Keeping these efforts going so long after the earthquake is not easy. In its second year, KIRP now gets supports from Japanese students and plans restoration activities with international exchange.

Satō Masamune

MSc Student, Graduate School of Agriculture

From 1st to 5th April, I was in Ishinomaki helping clean up the sand and mud that the tsunami brought, as well as cleaning out houses. The reason I went to the disaster area is because I felt that there was something I could do. I didn't really have a lot of money to donate or any specialist skills to help with the recover, and so I realised that I could help out physically.

It's very hard to put into words how things were in affected area. The car perched on top of a three-storey building, other buildings torn off their foundations, boats halfway up hillsides. At night the temperatures still dropped below zero, and during the day the constant aftershocks and wailing sirens only added to everyone's exhaustion. Each day we had to get up early to start work. Yet we all kept our spirits up – there was too much to be done to give anyone time to start feeling depressed. Then, of course, there were the smiling faces. On the third day, we went to help tidy up at someone's home. Seeing how we were trying to be cheerful in our work, the wife started laughing. Afterwards, her husband said that it was the first time that she had laughed since the tsunami had happened.

There is still a lot of volunteer work to be done. However I think the main thing is you do now what you can do. As a Japanese person thinking about what may happen to Japan in the future, I want to carry on do what I can to help.

Yamamoto Hayato

BA student, Faculty of Law, Economics, and Humanity

I spent just over a week volunteering in the fishing port of the one of the most affected towns, Minamisanriku. I was helping the shipping of wakame seaweed, which they farm in the area. The work was boring and hard, but I was able to forget how tired I was when the local people thanked me for the help. Individually what I could offer the disaster area was of course not very much. But as part of a team, there is so much more you can do. My whole experience was very valuable, making new friends, having good experiences but also worrying about how to face the local people. Probably the biggest thing that I got of it was realising that even if it takes a very long time, the disaster areas will recover. The reason I say that, is because I really felt the strong energy that the people working in the fishing cooperative and those at the seaward farm had. I'm sure they had all really suffered a lot, but you couldn't tell as they cheerfully went about their work. That is something you can only understand if you go there. It was quite difficult getting all the way there from Kagoshima, but it was well worth it. I hope I will have the chance to go again.



Of all the relief effort that has been undertaken, actually going to the disaster areas has been a big learning experience for the volunteers. Here we pick up several students who went. For those who experienced the disaster we cannot begin to comprehend the impact. However spending time together, just being there for them, these small things that all add up for those in the disaster areas to give them support. At the same time it has given strength to our students, creating bonds between them and the disaster areas.

Notice: Please contact to the Volunteer Support Centre which gives information about volunteer activities, organises insurance, lends out sleeping bags amongst other things, as well as providing partial financial support for students travel expenses.

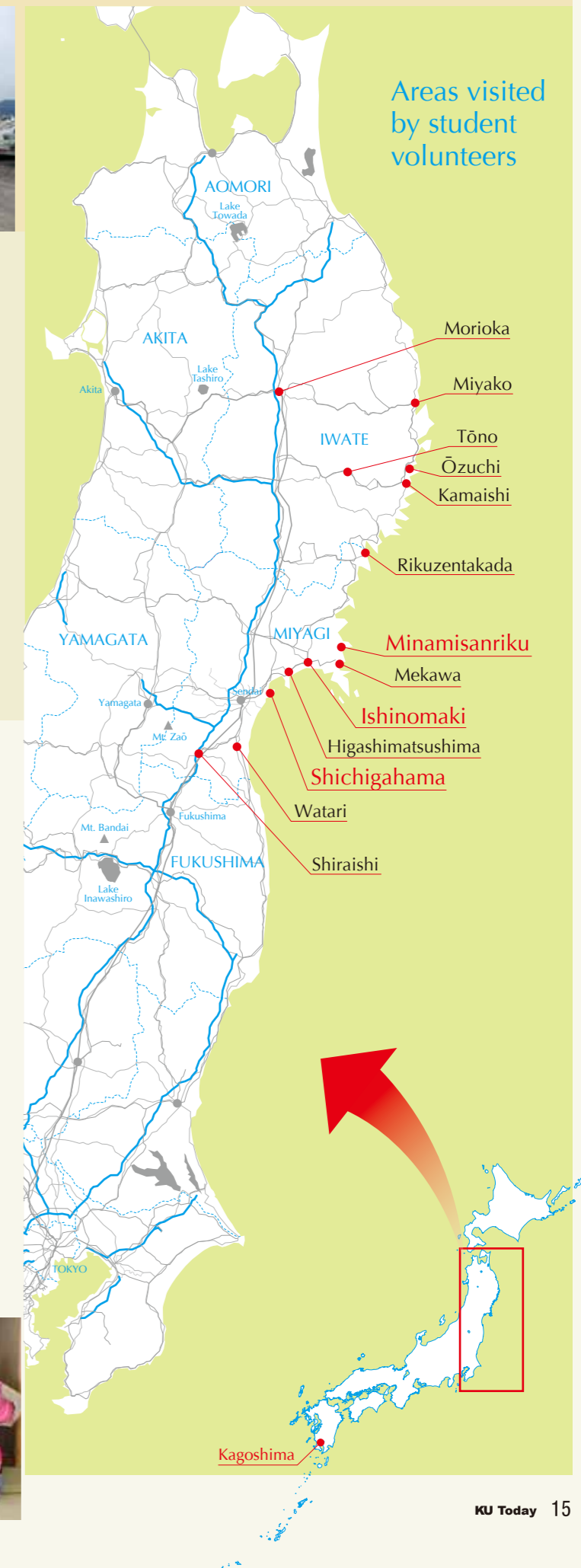
Waki Ryōsuke & Furukawa Mai

BA students, Faculty of Law, Economics, and Humanity

We went to Shichigahama in Miyagi Prefecture in February 2012 to take part in a study support programme. Seeing these children who had suffered so much during the disaster made us realise how strong and full of potential children can be. On one hand the children's smiles and laughs really encouraged us, yet on the other when they talked about the disaster it was heart-wrenching.

Mai: The people in the disaster areas said that the most frightening thing for them was being forgotten. As time goes by, I think that one of the roles of the relief efforts is to keep what happened fresh in everyone's minds. I still want to do what I can to help even from far away.

Ryōsuke: The number of reports about the disaster areas on the news has dropped, but relief is still needed. For those who want to do something but are not sure what they can do, I would say that no matter how small your activity, just doing something is important.



Student “Enterprise” Awards

Kagoshima University established an award system for encouraging students to undertake special challenges with a spirit of enterprise. On 24th February, candidate students gave presentations on their respective projects and activities which were judged by ten distinguished panelists such as Mr. Inamori Kazuo, founder of the Kyocera Corporation. The highest award was given to a sea turtle study group represented by Watanabe Mizuki, a student from the Faculty of Fisheries. The group has continued a patrol of nesting places at Fukiagehama beach for the last 30 years, collected biological data on sea turtles and contributed to increasing the number of turtles safely breeding there.



The runner-up prize was awarded to the following three groups and one individual candidate. One went to a resuscitation training club led by Tadano Yasunori, a medical student. Another was to Free Spot, a project group for revitalizing a remote village in decline, and the third was awarded to a Sustainable Campus Project team. As an individual achievement, Imazato Takumi a member of the university boxing club from the Faculty of Education received a runner-up prize for winning the rookie of the year title in the western region boxing league.



Agreement on next generation energy signed

Kagoshima University and Satsumasendai City signed an agreement for the development of next generation energy. Satsumasendai City, one of the region's centers of nuclear and thermal power production, moved ahead with a proposal for creating a safe town using next generation energy. Kagoshima University with its many experts on new energy generation such as solar power, wind power, tidal power, and biomass is to provide support and advice for the project. Based on this new agreement corroborative research for the new energy project will be initiated.

Joint Faculty of Veterinary Medicine founded

Kagoshima University established a new faculty of veterinary medicine in April 2012. This is a joint faculty in cooperation with Yamaguchi University and the first inter-university joint faculty establishment of its kind in the country. Today's increasing demand for diverse roles, examination of various animals and higher all-round expertise in veterinarians requires the education of veterinary students be more intensive and enhanced. The development of this joint faculty will enable both universities to compliment each other in order to provide a world class education in veterinary medicine and to become a leader in this field in Asia.



Discussion about the globalization of Kagoshima University

Kagoshima University held a symposium for discussing with local community representatives the issue of allowing university entrance in September (Japan's academic year begins in April). Last year Tokyo University, one of the leading Japanese universities, announced a plan to introduce a new system to start the academic year in September, for the convenience of students who come from and or attend universities abroad. The symposium was held to consider the importance of globalization of the university and at the same time to consider its role in fostering human resources within the local community.

After the key note speech by university President Yoshida, four representatives: one from business and industry, another from a medical service, the third from the education community, and the fourth from an international club gave their opinions. Over two hundred people both from the university and from the general public participated in a meaningful forum to share opinions and consider the educational policy of Kagoshima University.

Completion of the new Kagoshima-Maru, a next generation training vessel

On 30th March 2012, Kagoshima University celebrated the launching ceremony for the Kagoshima Maru IV at Taniyama port in Kagoshima. The new Kagoshima-Maru (935 GT) was designed as a cutting edge training vessel that has very unique capabilities in that it can continuously gather oceanographic data while sailing. Together with Nansei-Maru (175 GT), Kagoshima University's two research vessels provide students with on-board training for navigation, seamanship, fishing gear operation, ocean research, meteorology and sampling. They are also expected to be utilized openly as inter-university research facilities.



ASM International Award for Dr. Katanoda

An article by Dr. Katanoda, associate professor in the Graduate School of Science and Engineering, got the award of Outstanding Review Paper of 2011 in the Journal of Thermal Spray Technology. The journal is edited by ASM International, a prestigious academic society that serves to further materials science and the engineering profession.

Thermal Spray is coating techniques which allow many problems of wear resistance, corrosion and thermal degradation to be resolved. His reviewed paper is on the development of warm spray, a new coating technique. The awarded article is “Current Status and Future Prospects of Warm Spray Technology” by S. Kuroda, M. Watanabe, K.-H. Kim and H. Katanoda, in *Thermal Spray Technology*, Vol. 20, No. 4, 2011, pp. 653-676.





ŌSHIMATSUMUGI

— A WOVEN FABRIC OF BEAUTY AND ART LEARNED FROM NATURE

大島紬～自然に学び、美と技を追求した織物～

By Professor Seto Fusako
Faculty of Education

Ōshimatsumugi is a unique woven fabric that has developed over time reflecting the natural environment of Kagoshima, and the local wisdom and innovation of the people who live there. Since ancient times, people have used vegetation growing wild in their surroundings to dye clothing. Similarly the farmers in Amami-Ōshima who worked their rice fields noticed that their clothing drenched in mud would often become blackened with a natural dye which was impossible to remove, and it is this said that was the origin of the tsumugi dyeing technique that has been passed on over the years till today. The rich mud of Amami-Ōshima's farmland is soft-edged and very fine with a grain size of less than 0.002mm containing a large amount of bivalent iron. As a result as a dyeing agent the mud bonds well with a mediation of fabric and dye, and the mud itself is absorbed into the fabric without any damage to the yarn, with the result being a sun and wash-durable dyed fabric.



Many varieties of plants are widely used for dyeing yarn or fabric, but the native plant used for creating the color of tsumugi is one especially unique to Amami-Ōshima, the umbellate (teichigi) an evergreen bush from the rose family. The brew extracted from boiling umbellatta (which has high tannin content) is used to dye the yarn multiple times, and the yarn is then immersed in the mud. This process is repeated many times until the yarn turns into a rich black color with a silky consistency. This particular kind of high quality tsumugi is called 'dorai-ōshima'. Indigo or other plant based dyes and synthetic dyes are also used.

Their intricate designs vary widely from cycas palms to habu snakes, turtle shells, traditional patterns, or people or landscapes, featuring the culture of Amami-Ōshima. Ōshimatsumugi is special in that both the warp and weft are dyed threads. Both are first woven, dyed and then painstakingly unpicked leaving mottled threads that are later woven together to create the designs. This delicate process of combining up and down threads, known as 'double interweaving', can result in an unlimited variety of intricate patterns.

The main distinctive types of Ōshimatsumugi are called *dorai* (silky black), *kusaki* (plant dye), *ai* (indigo), *iro* (colorful), and *shiro* (white). The finished products are inspected for quality, trademarked, and given an authenticity certification label as a guarantee of quality.



Typical design

*Front Cover



Statue of
Dr. Takayasu Shin-ichi
(1884-1973)

1st president of Kagoshima
Prefectural Medical School,
precursor of today's Faculty
of Medicine