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NTU



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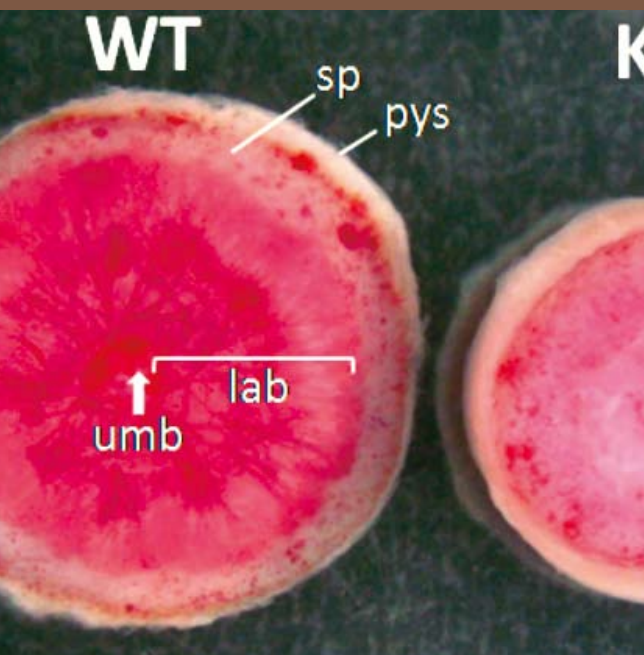
Faculty & Students Volunteer to help Typhoon Survivors

NTU Scientists Win Int'l Recognition

**Exhibit marks 10th Anniversary of 921
Earthquake**

Robot as Campus Tour Guide

Special Report
Chubei Campus Under Construction



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NTU AT A GLANCE

NTU Museums Group Holds Exciting Activities and Exhibitions This Fall



Final Beam Raised on Chubei Campus Building in Anticipation of December Completion

Bearing the signatures of the ceremony's guests, the precast beam is hoisted securely into position on the building's roof to the celebratory sounds of music and fireworks. The placement of the beam marks an important milestone in the building's construction.

Guests of the beam raising ceremony sign their names to the building's final structural beam as they pose for a group photo.



In a ceremony held on August 31, the final overhead beam was hoisted over NTU's new academia-industry cooperative R&D complex at its Chubei Campus. NTU Vice President for Administrative Affairs Bau Tzong-ho, Hsinchu County Commissioner Cheng Yung-chin and Ruentex Group CEO Samuel Yen-liang Yin presided jointly over the beam raising ceremony. Other official participants in the ceremony were NTU Dean for Research and Development Ji-wang Chern, Dean of General Affairs Fu-shu Jeng, Hsinchu County Councilor Shin-ying Hsu, Chairman Wang and Secretary Wang of the Kuang-chao Wang Academic Foundation, as well as Chairman Lai and President Mo of Ruentex Group. Unfortunately, Dr. Hsu, who contributed the building, was in the United States for the annual meeting of the NTU School of Pharmacy Alumni Association in North America. But, he viewed the entire ceremony in real time via the Internet. The ceremony was simple yet significant, and raised

expectations for the scheduled completion of the construction work in December.

With six floors and a basement, the capacious reinforced concrete structure will accommodate cooperative research work between NTU and industry. Research teams dispatched from the College of Electrical Engineering and Computer Science, College of Life Science, College of Engineering and College of Medicine will be the first to utilize the facility.

During the ceremony, Vice President Bau declared that during the tenures of past NTU President Wei-jao Chen and current President Si-chen Lee, NTU made developing the Chubei Campus a top priority, but it was only with the generous donation of Dr. Hsu, an alumnus of the NTU Department of Pharmacology, that NTU could at last surmount the challenges and proclaim that, "NTU is here." Bau added that Dr. Hsu deserved even greater gratitude for making a separate donation of

NT\$10 million to establish a rescue fund for students from areas devastated by Typhoon Morakot in August of this year. Bau said it was really NTU's good fortune to have Dr. Hsu, calling him an alumnus of rare compassion and generosity who delighted in feeding back to his old alma mater.

Bau also acknowledged the governmental support provided by Commissioner Cheng, as well as Ruentex CEO Yin's prefabrication construction technique (he holds the patent) and his professional construction crew, as crucial to the smooth development of the complex, which allowed NTU to keep its promise to the local community.

As a symbolic declaration of their best wishes for the new building, the ceremony guests signed the precast beam before it was hoisted into place.

Polaris Financial Group Makes Generous Donation to NTU to Establish Quantitative Finance Program for College of Management



▲ Guests of honor pose for a group photo at the signing ceremony.

Polaris Financial Group recently donated NT\$3.5 million to the NTU College of Management to establish a Quantitative Finance Program. Polaris is already a well-known benefactor of NTU. Four years ago, the group teamed up with the university to set up the NTU and Polaris Financial Education Research Center.

The signing ceremony for the new program took place at the College of Management. The guests of honor included NTU Financial Vice President Ming-je Tang, Polaris Financial Group President Shiao-da Lin, Polaris Financial Group Vice President of Financial Market Department Ling-he Chen, Polaris Financial Group Vice Executive Director of Financial Market Department Jung-cheng Chiu, Polaris Financial Group Vice President of Risk Management Department Chao-shien Shieh, College of Management Associate Dean Su-ming Lin, as well as five department heads from the College of Management. Polaris and NTU both look forward to this academia- industry cooperative

program to nurture coming generations of financial elite for Taiwan.

Polaris Financial Group Vice Chairman Fred Pai noted that what distinguishes the financial industry from other industries is that the financial industry doesn't have raw materials, factories or inventories. He said that the nurturing of a dedicated and effective financial elite to run this unique industry is crucial for the future vitality of the nation. Pai added that he expects the new program to cultivate internationalized financial professionals in Taiwan.

College of Management Dean Mao-wei Hung expressed his appreciation to Vice President Tang for serving as the go-between in the creation of this program.

Chairman Pai commented that unlike the IT industry, which may donate just computer equipment, Polaris Financial Group believes in supporting academic programs and scholarships to produce financial



▲ NTU Financial Vice President Ming-je Tang and Polaris Financial Group President Shiao-da Lin complete the signing of the donation agreement.

experts. This will benefit both the financial industry as well as the educational program here at NTU.

The Quantitative Finance Program will accept 50 students each year, and is open to all NTU students. The program's eight core courses will be Macroeconomics and International Finance, Quantitative Methods in Finance, Financial Products and Markets, Derivatives, Modern Investment Management, Quantitative Training Strategies and Simulation, Financial Engineering and Computation, and Special Topics on Financial Engineering.



NTU Researchers Develop Cleaning Compound to Break Down Dangerous Viruses and Bacteria on Skin

The 2009 H1N1 virus, aka swine flu, has appeared in over 100 countries. While cases in North America and Europe register mortality rates of 2-4%, Asia has managed to avoid a serious outbreak due to its hot climate.



NTU Professors Shi-ming Lin and Chih-kung Lee and Tamkang University Professor Adam Shih-yuan Lee of the NTU Nano-BioMEMS Group

Nonetheless, the region has witnessed Tamiflu-resistant local H1N1 strains and the virus is expected to spread and become virulent as temperatures drop in the fall and winter.

At a press conference on July 21, NTU Academic Vice President George Tai-jen Chen announced that NTU Nano-BioMEMS Group researchers had created a chemical compound called NTU-VirusBom that can be applied externally to break down the surface structures of nano-scale viruses, including H5N2 and H5N1 (avian flu), H1N1, Tamiflu-resistant H1N1 and enterovirus 71, as well as micro-scale bacteria, including *Staphylococcus aureus*. The "dual-resistance" compound has



NTU Academic Vice President George Tai-jen Chen presides over the NTU-VirusBom press conference.

undergone ample tests and has been proven safe for human use.

The successful promotion and application of NTU-VirusBom stands as a fine example of making use of NTU R&D achievements when most needed. NTU has transferred the technology for NTU-VirusBom to a firm that is now rushing to commercialize the compound and deliver its benefits to the public. Thus far, the compound has been found effective for three categories of products: cleaning products, including sprays, dry hand cleaners, liquid hand soap, laundry detergent, wet towels and air fresheners; air filtration devices, such as filters in air conditioners and air cleaners; and protective gear, such as face masks and protective clothing.

H1N1 is transmitted both through the air and by direct contact. Outbreaks of the virus occur rapidly; it can spread across a wide area and its complications,

bacterial and viral lung infections in particular, can be severe. When an outbreak occurs, the elderly and people with preexisting cardiovascular, pulmonary, renal or metabolic diseases, anemia or who have weakened immune systems account for the majority of those who come down with severe complications and possibly death. H1N1 mortality rates around the world have reached 2-4%, but scientists are forecasting that the virus will enter its peak period as temperatures drop this fall.

Avian flu spreads primarily among birds, for which the virus is highly contagious and deadly. Death rates for humans infected with the virus have reached 50% or more because humans lack antibodies. Consequently, this virus could develop into a major epidemic.

Enterovirus 71, a form of enterovirus that is global in extent, readily leads to complications of the nervous system. Young children are the group most at risk of experiencing severe complications or death. Mortality rates for those suffering severe complications range from 3.8-25.7%.

NTU Faculty and Students Work All-out to Help Survivors of Typhoon Morakot

Typhoon Morakot swept across southern Taiwan on August 8, causing deadly mudslides and flooding. NTU faculty and students responded by providing donations and disaster relief, and the university devised four channels for its disaster relief efforts.

One channel was to encourage NTU students, faculty and staff to make donations and provide relief to the victims of the typhoon.

Another channel was the provision of emergency student aid. NTU conducted an exhaustive check of all its students from disaster areas in order to confirm that they were safe. The university relied on its standing emergency student aid mechanisms as well as the NTU Alumnus Dr. Chao-



Ⓐ Brimming with enthusiasm to lend a helping hand, members of NTU's student clubs head to disaster areas to take part in clean-up operations.

hui Hsu Donation and Disaster Relief Emergency Fund, a NT\$10-million fund set up before classes started this semester to ensure that students from stricken areas can continue their studies at NTU.

On another front, NTU also promoted direct community service. On August 16, NTU student clubs set out for disaster areas to provide assistance under the theme "NTU Has Love—Sending Love to Disaster Areas."

Also crucial was holding NTU public forums and helping academics offer assistance to the government in conducting post-disaster reconstruction and planning work.

In the wake of the typhoon, resources were concentrated initially on rescuing victims and providing them with safe havens. As for follow-up issues such as relocation and reconstruction, long-term recovery planning will require the combined efforts of experts and scholars from a wide range of fields, including medicine, public health, environmental engineering and meteorology. The university also encouraged NTU students to provide assistance and counseling at recovery centers in disaster areas.

OIA Helps New International Students Get to Know NTU and Taiwan



Ⓐ Students from the NTU International Student Information Service divide new international students into groups for campus tours.

The NTU Office of International Affairs held a welcoming activity for newly-arrived international exchange students and international visiting students on September 9. This semester, NTU is proud to open its arms to about

260 students from 96 institutions in 19 countries.

After first meeting for a welcoming program indoors, the new international students were taken outdoors on campus tours led by students from the NTU Foreign Student Association and NTU International Student Information Service. The tours introduced some of the campus' most scenic spots as well as the locations of important administrative offices. Afterwards, the NTU International Youth Club received the new students in the Second Student Activity Center's Global Lounge for an activity highlighting Taiwanese culture.

The lively activity acquainted the students with the customs of Taiwan.

Some of these new students will study at NTU for one semester while others will stay for a full school year. No matter how long they intend to stay, they all experience feelings of anxiety and unfamiliarity as they enter a new and different linguistic and cultural environment. The series of OIA and student club welcoming activities quickly familiarized the new international students with the NTU campus as well as lifestyles and customs in Taiwan.



Two NTU Chemists Named Fellows of Royal Society of Chemistry

Two NTU professors in the Department of Chemistry, Prof. Shie-ming Peng and department head Prof. Pi-tai Chou, were awarded fellowships in the Royal Society of Chemistry in June. The scholars were among just three Taiwanese chemists to be named fellows of the prestigious society this year.

Prof. Peng's specialization lies in inorganic chemistry and crystallography. His research interests include the synthesis and characterization of metal complexes that have delocalized ground states and possess unusual redox, spectroscopic, magnetic and structural properties, for example the metal complex of o-quinonediimine and diimino-succinonitrile. Peng previously headed the research project "Nano

Science of Advanced Materials," and now manages an outstanding pilot project. Being named a fellow of the Royal Society of Chemistry adds to the many outstanding achievements of Prof. Peng's career. He was named an academician of Academia Sinica in 1998 and a fellow of the Third World Academy of Sciences in 2004.

Prof. Chou focuses his research on optoelectronic materials and organic molecular photophysics. His research interests are broad yet are all based on the fundamental principles of optoelectronics. Chou has made contributions as an innovator and initiator in each of his research fields, and is internationally regarded as a prominent scientific researcher. Prof. Chou has numerous academic

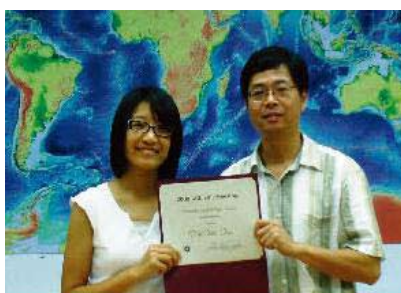
achievements and honors. His honors include the National Science Council Excellent Research Award, Ho Chin Tui Outstanding Scholar Award and Ministry of Education's National Lecturer Prize. NTU appointed Chou as a chair professor in 2001 and as a distinguished professor in 2007.

Many faculty members of the Department of Chemistry have been honored with prestigious awards over the last year. This reflects their determination and work ethic, for which they have drawn recognition in Taiwan and from abroad. The department hopes its chemistry faculty will continue conducting outstanding research and playing a significant role in NTU's march to become one of the elite universities of the world.

American Geophysics Union Presents NTU Geosciences Student with Outstanding Paper Award

The American Geophysics Union presented Chen Nai-chen, a graduate student in the Graduate Institute of Geosciences, with an Outstanding Student Paper Award at the 2008 AGU Fall Meeting in December 2008. Chen's paper detailed her research team's discovery of a special carbon cycle in deep sea sedimentation. Chen's international recognition brought honor to NTU by underscoring the excellence of the university's education.

As an undergraduate, Chen



won a grant from the Ministry of Economic Affairs to participate in a natural gas hydrate survey project conducted by the MOEA's Central Geological Survey. Her research team included researchers from the NTU Institute of Oceanography, Tokyo University and Nanjing University. The team discovered abnormal changes in carbon

isotopic compositions in bisections of deep sea sediment and proposed that vibrant microbial activity in environments at certain depths causes an abnormal carbon cycle. The team's findings provided an important clue for determining whether the seas off Taiwan's southwest coast harbor abundant sources of the natural gas hydrate methane.

Chen completed her thesis under the guidance of Department of Geosciences Prof. Frank Yang. She passed her oral defense to earn her master's degree this past June.

NTU Ranks 102nd Among World Universities for Scientific Papers

NTU ascended to the overall ranking of 102nd among the world's 500 leading universities in the 2009 Performance Ranking of Scientific Papers for World Universities released by the Higher Education Evaluation and Accreditation Council of Taiwan (HEEACT) on July 30.

Besides the overall ranking, the evaluation includes rankings by field. NTU placed 32nd in the field of engineering, computing and technology and ranked 66th in the natural sciences. The university's positions in the four fields of agriculture and environmental sciences, clinical medicine, life science and the social sciences all reached the top 300. Notably, NTU's performance in the social sciences ranking entered the top 300 for the first time, with a ranking of 217th.

HEEACT developed the Performance Ranking of Scientific Papers for World Universities in 2007 in order

to ascertain the global academic competitiveness of Taiwan's research-oriented universities. The ranking system uses the categories of research productivity, research impact and research excellence to carry out quantitative and qualitative assessments of the scientific research papers of the world's 500 leading universities. In 2008, the council began publishing rankings by fields. These rankings rate the world's 300 leading universities across the six fields above.

This year's ranking includes another innovation. HEEACT designed evaluation weightings to lessen the unfair advantages larger universities would have in the rankings due to the greater volumes of papers produced by their larger faculties. Interestingly, without this feature, NTU would have ascended to an overall ranking of 67th.

NTU Teams Grab Three Top Prizes at 2009 National Robotics Contest in August

Two teams from NTU grabbed three top prizes during the 2009 National Robotics Contest on August 8. A "home" robot designed by a team composed of graduate students from the Department of Electrical Engineering and the Department of Computer Science and Information Engineering won top prize in the Dreams Come True category while also earning a champion's prize of NT\$200,000. ADAM, an intelligent robot arm created by a team from the Department of Mechanical Engineering, claimed the competition's highest award of NT\$400,000.

The annual contest is held under the joint sponsorship of the Ministry of Economic Affairs and the Ministry of Education. This year's goal was to build intelligent



Prof. Li-chen Fu guided students from the Department of Electrical Engineering and Department of Computer Science and Information Engineering in the creation of their "home" robot.

home service robotics products. A total of 147 student teams competed for a combined NT\$3.18 million in awards.

The "home" robot team's robot, Julia, combines simultaneous mapping with localization and navigation technology to allow the robot to move autonomously around an interior household environment. Julia also provides such services as voice

announcements, object delivery, audio-video capabilities, news reports and Internet-accessed remote security monitoring.

One Julia team member said that in the future Julia could be integrated with such already successful digital service platforms as 7-ELEVEN's ibon kiosks and Apple's iTunes Store in order to permit users to enjoy such conveniences as purchasing tickets or downloading music from home.

Department of Electrical Engineering Prof. Li-chen Fu, who provided guidance to the Julia team, said the purpose of the competition was to promote the development of Taiwan's robotics industry. This year's theme of innovative home service robots, he said, served to stimulate students' imaginations about products and provide ideas for companies to consider in developing new products.



Regional Students Share Experiences at NTU's Pacific Asia Student Seminar in August

The Pacific Asia Student Seminar 2009 got off to a lively start at NTU in the auditorium of the College of Liberal Arts on August 10. A total of 37 students from Taiwan, China, Hong Kong, Singapore, Japan, South Korea, the United States, Canada and Spain, accompanied by 17 facilitators, took part in the eight-day seminar which adopted as its main theme "cross-strait relations in the context of the development and integration of the Asia-Pacific region." PASS 2009, the first of what is hoped to be an annual event, was organized by the NTU Social Science Student Association and the NTU Taiwan Japan Student Conference.

PASS is designed to give young people in the Asia-Pacific region the opportunity to exchange experiences and gain deeper understandings of each other. This year, each day of the seminar was organized around a designated theme with the aim of engaging students in discussions concerning the Asia-Pacific region and cross-strait relations in terms of the six categories: history, politics, economics, culture, human rights and civil society. Students taking part in the seminar shared their ideas and had the chance to see the world from the points of view of students from other countries.

Courses in PASS 2009 were led by a number of renowned scholars and experts in Taiwan.



NTU hopes the establishment of PASS will help students reconstruct their understandings and concepts of the Asia-Pacific region.

These included Prof. Wan-yao Chou of the NTU Department of History, Prof. Rwei-ren Wu of the NTU Department of Political Science, Prof. Chi-chen Chiang of Soochow University's Department of Political Science, former minister of economic affairs and representative to the World Trade Organization Yen Ching-chang, and President and CEO of the Public Television Service Foundation Sylvia Feng. The seminar also adopted a special open panel discussion approach. This called for each student to research a sub-topic chosen from the six categories above and introduce it to their classmates for discussion.

In addition to attending classes, the PASS students also got acquainted with the path of Taiwan's development by taking field trips to cultural and political sites. These included the Red House performance hall in

Taipei's Hsimending, the offices of the Executive Yuan's Mainland Affairs Council and 228 Memorial Park, which was established in memory of the victims of Taiwan's White Terror. Moreover, the seminar took the students to Kaohsiung City for two days to focus on the history of the development of human rights in Taiwan.

Having succeeded in creating an academic opportunity for students from around the Asia-Pacific region to share and learn about each others' countries, NTU hopes PASS will be established as a regular annual seminar hosted by countries in the region on a revolving basis. The university looks forward to the seminar bringing more students together over the coming years and creating a brighter future for the Asia-Pacific region as a whole.

College of Engineering Completes Successful Summer Program with University of South Carolina



1: NTU students work with USC graduate students in the lab. 2: NTU students enjoy outdoor activities with students from the University of South Carolina. 3: Students receive certificates from USC's Prof. Amiridis and Prof. Chaudhry.

NTU's College of Engineering started a new summer program called "American Culture, Language and Research Program" in collaboration with the University of South Carolina this summer. The four-week program offered three hours of English language instruction daily in the mornings and assigned students to internships in labs of their respective specializations in the afternoons. Students who completed the course earned three elective credits at NTU.

The College of Engineering has been active in expanding its international cooperation with NTU's partner universities around the world in recent years. Though the college has collaborated on research, held joint conferences and promoted student exchanges with partner universities, the summer program posed a new type of challenge. Nonetheless, the college not only achieved its goal for the program, but also did so in a very successful way. Since it was the first time for the

college to collaborate on such an overseas summer program, the college's associate dean, Prof. Chia-pei Chou, was assigned to escort the students to USC and make a courtesy visit on behalf of NTU.

Morning English classes were divided into grammar, writing, reading and vocabulary sections. On the first day, the students took a two-hour English Program for Internationals placement test and were assigned to different classes according to their levels. Ten to 15 students from various countries were enrolled in each class. The small classes allowed the students to get more attention from their instructors and provided ample opportunities to communicate with their classmates from around the world. The students not only developed their English skills, but also learned about cultural differences. Furthermore, USC arranged a number of extracurricular activities for the students, including the July 4th Independence Day celebration,

the South Carolina State House, museums, a zoo visit and baseball games.

Students who participated in this program were from both the College of Engineering and College of Electrical Engineering and Computer Science, and ranged from freshmen to seniors. Each student was assigned to a lab based on his or her major and year. USC recruited their best professors for the program and assigned each student one graduate student as their lab trainer. In addition to learning technical knowledge, the students also made good friends and were able to practice English in the labs. Each student received an internship certificate at the end of the program.

Though the academic aspects of the program were challenging, the students had time to enjoy the pace of life at USC and, most importantly, they broadened their horizons and made new friends.



Center for Biotechnology Invites Leading Scientists to Promote Cutting-Edge Membrane Protein Research

While the primary responsibility of the Center for Biotechnology is the organization of core training courses and integration of teaching programs, the center has recently begun to turn its attention to cutting-edge research as well.



1: Participants pose for a group photo following Prof. Huber's lecture. 2: Prof. Robert Huber goes for a dive. 3: Prof. Chikashi Toyoshima at the NTU Center for Medical Excellence



In the wake of the success of the "Maestro Lectures on Structure and Function of Membrane Proteins," which were held in coordination with NTU's 80th Anniversary in 2008, five world-renowned scientists (all academician level, including two Nobel Prize laureates) who took part in the lectures have accepted invitations from NTU to serve as distinguished research chair professors. Their appointments took effect on August 1. This special honor was achieved through the efforts of NTU President Si-chen Lee, Vice President for Academic Affairs George Tai-jen Chen, Director of the CBT Shih-torng Ding, as well as the former and present directors of the Center for Medical Excellence, Profs. Chen and Yang.

This special lectureship on biomembrane and membrane

protein research is to be located on the second floor of the CBT, and will have a medium-sized lecture hall with a VIP lounge for the distinguished lecturers. In conjunction with the CBT's Cell Biology and Proteomics Core Facilities, the new X-ray diffraction instrument of the Institute of Biological Chemistry, the outstanding Bio-EM research core of the Department of Physics and the Genomics/Proteomics Core Facilities of the Center for Medical Excellence, this lectureship will provide NTU with an integrated platform for structural biology and biomembrane/membrane protein research. Moreover, a small-angle X-ray scattering core facility for determining the envelope structures of proteins in solution is being prepared in order to attract more principal investigators, especially those who are hesitant due to concerns over membrane protein crystallization, to join this cutting-edge field of research.

Vice President Chen said of the Maestro Lectures in 2008, "Our goal is not only set for the celebration activities, but for long-term academic cooperation."



Together with the international collaboration projects organized by the Office of Research and Development, visiting scholar programs will reinforce in-depth research between NTU and the laboratories of the visiting lecturers.

This December, Profs. Robert Huber, So Iwata and Chikashi Toyoshima will visit NTU again to attend the First Formosan Mini-Symposium on Membrane Proteins and Biomembrane Research organized by the CBT. Profs. Johann Deisenhofer and Tom Rapoport are scheduled to return to NTU in April. The CBT awaits the return of these world-class scientists with excitement and looks forward to collaborating on cutting-edge research in the field of structural biology.

OIA Provides First Group Airport Pick-up Service for International Students in September



International students and NTU volunteer students pose for a group photo at Taiwan Taoyuan International Airport.

The NTU Office of International Affairs provided a group airport pick-up service for arriving international students for the first time in September. OIA student assistants and volunteer students welcomed 133 international degree students and international exchange students preparing to begin the 2009 academic year on their arrival at Taiwan Taoyuan International Airport. After being provided reception services, the students were delivered by a 43-seat chartered tour bus to Prince House-NTU Shuiyuan Dorms, the International Youth Center and Prince

House-NTU Changhsing Dorms. The well-planned service ran smoothly, and impressed the new students with the university's administrative efficiency.

Having tested the system for two months, the OIA in July notified international students by email that it would be providing nine pick-up periods in September. Newly-arriving international students wishing to take advantage of the airport reception service were simply required to fill out an on-line form leaving their flight arrival information, terminal number and the time they wished to be pick-up.

When the new students arrived, they were greeted by OIA reception personnel dressed in red polo shirts and holding a welcoming banner. The personnel helped the students exchange currency and apply for mobile phone numbers, and tagged their luggage for delivery to their dorms. The students were also provided with face masks due to current global concerns over the spread of the H1N1 flu virus.

Finally, on arrival at their dorms, the international students were greeted by dorm resident directors and student volunteers who helped them move into their dorm rooms and purchase daily-use items.

OIA and International Youth Club Hold Taiwan Culture Activity for New International Students

The NTU Office of International Affairs was joined by the NTU International Youth Club in holding a special Taiwan culture activity for NTU's new international students in the Second Student Activity Center's Global Lounge on September 9. The event, designed to impress the new students with Taiwan's local culture and the passion of her people, introduced interesting food, entertainment and scenic spots in and around Taipei City and the city's MRT system, and provided fun activities.

In the open space of the Global Lounge, the activity was intended



New international students take part in a chop sticks holding contest during the Taiwanese culture activity.

to spur interaction between NTU's local and international students and help the international students adapt to campus life at NTU and get local students to broaden their international vision.

During the activity, the International Youth Club introduced the students to interesting eateries, night markets and

popular scenic spots in a program called "A Day in Taipei." The students also shared local foods and beverages and played games, including a chop stick holding contest and a balloon stomping game.

The Global Lounge is equipped with a large LCD display that shows news programs from around the world. It also displays national flags and cultural items from other countries and provides a bar and kitchen for international activities.



Fully-Automatic AI Tour Guide Robot Premiered by NTU Students After Three-Years Development

A team of students led by Prof. Han-pang Huang of the Department of Mechanical Engineering introduced their fully-automatic artificial-intelligence (AI) tour guide robot to the public at a research presentation meeting held in the Gallery of NTU History on August 20. The team of students included Lin Kun-han, Huang Ruo-feng, Chen Tsi-huei, Chen Chih-fan and Chong Shu-yun.

Working in the Robotics Laboratory, the team used a budget of NT\$3 million to develop the robot in three years. The robot's main features include facial recognition, facial expression, vocal commentary, obstacle avoidance, site-specific vocal commentary, and two-dimensional and three-dimensional environmental mapping capabilities.

The guide robot uses video technology to determine when a guest is present and invites the guest to select a site he or she would like to visit. It then leads the guest to the desired location and provides site-specific commentary. Moreover, the robot also introduces points of interest as it escorts its guest to the requested location. The robot's lively neck movements and facial expressions imbue it with a friendly appearance and help it attract and maintain the attention of its guests.

Prof. Huang says, "Another important feature of the robot is its ability to construct two-dimensional and three-dimensional maps. For example, it can be placed at the Gallery of NTU History, or it can be placed at the Taipei Fine Arts Museum, or the National Taiwan Museum of Fine Arts, or anywhere, and it will establish a complete map. After it establishes its map, it can navigate and provide commentary based on that map."

Huang also highlighted one of the robot's strongest features. He noted that while global positioning systems provide only two-dimensional



▲ The fully-automatic artificial-intelligence tour guide robot attracts the attention of its guests with its cute facial expressions and appearance.

maps and may be inaccurate by three to ten meters or more, the robot his team developed is capable of simultaneously reconstructing both two- and three-dimensional maps and that these maps achieve a precision of up to ten centimeters. Huang said the applications of this technology include making robots that serve as store guides and installing the technology on driverless cars. He said these applications could be highly profitable.

The research team chose the Gallery of NTU History as the location of the presentation conference in order to demonstrate the guide robot's capabilities in a real human environment and to allow guests to learn about the university's illustrious history. The team says the robot can automatically conduct mapping and guide guests through any type of exhibition space.

NTU Designs Leading Software Predictor for Identifying DNA-binding Residues in Transcription Factors

Fig. 1 (b) The tertiary structure of the complex with PDB ID 1YSA. The residues colored by red are those sequence-specific binding residues correctly identified by ProteDNA, while the residues colored by blue are the false negatives.



A “transcription factor” is a group of proteins that bind to specific DNA segments and either activate or repress the expressions of the corresponding genes. In molecular biology, transcription factors play critical roles in regulating cellular processes. Therefore, understanding how transcription factors function is not merely of scientific interest; it is crucial for making advances in molecular diagnoses and therapies as well as in emerging biotechnologies. One basic issue in analyzing how a transcription factor functions is to identify its DNA binding site. There are two types of binding mechanisms in protein-DNA interactions, namely, sequence-specific binding and non-specific binding. Sequence-specific bindings occur between protein sidechains and nucleotide bases, while non-specific bindings occur between protein sidechains and the DNA sugar/phosphate backbone. In molecular biology, sequence-specific bindings correspond to sequence-specific recognition of genes and therefore are essential for correct gene regulation.

A team at NTU’s Center for Systems Biology and Bioinformatics recently designed an advanced



Fig. 1 (a) The partial prediction output of ProteDNA with the polypeptide sequence of Yeast transcription factor GCN4 in PDB complex 1YSA.

software predictor named ProteDNA for identifying the residues in a transcription factor that are involved in sequence-specific binding with the DNA. As reported in recent scientific articles, the tertiary structures of a large number of transcription factors are mostly unstructured, ProteDNA works completely based on analysis of the polypeptide sequences. In other words, it does not depend on the presence of the tertiary structure of the concerned transcription factor and therefore is more generally applicable.

The figures above illustrate the function carried out by ProteDNA. Fig. 1(a) shows the prediction output of ProteDNA for the polypeptide sequence of Yeast transcription factor GCN4, which was assigned with Protein Data Bank ID 1YSA. Fig. 1(b) depicts ProteDNA’s output in the tertiary

structure of PDB complex 1YSA. In Fig. 1(b), the residues colored red are the sequence-specific binding residues that were correctly identified by ProteDNA, while the residue colored blue is a false negative.

In order to accommodate different application needs, ProteDNA has been designed to operate under a *high-precision* mode and a *balanced* mode. Users can select either mode when submitting a question to the web server. Under the *high-precision* mode, ProteDNA delivers precision of 82.3%, specificity of 99.3%, sensitivity of 49.8%, and accuracy of 96.5%, while under the *balanced* mode, ProteDNA delivers precision of 60.8%, specificity of 97.6%, sensitivity of 60.7%, and accuracy of 95.4%. An article on the design of ProteDNA was published in the 2009 web issue of Nucleic Acids Research.



Microarray Core Laboratory Develops Novel Gene Detection and Analytic Methods for Microarrays

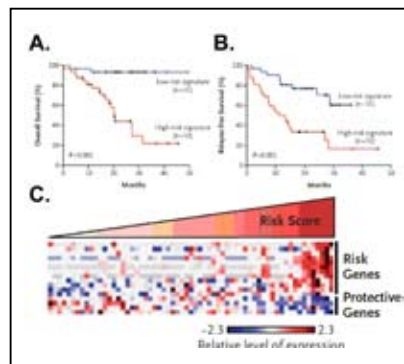
Microarray technology is one of the central platforms for functional genomics and translational research in the genomic era. The Microarray Core Laboratory provides state-of-the-art microarray platforms, one-stop services and integrated databases, and collaborates with experts in biostatistics and bioinformatics to assist investigators with data analysis. By accessing this facility, researchers are able to perform cutting-edge genomic research and achieve research excellence.

The Microarray Core Laboratory has successfully established several novel detection and analytic methods for microarrays to identify and characterize metastasis-related genes. One is the identification of cancer-related genes by oligonucleotide array. By using the array platforms the lab has established (Affymetrix and oligoarray), it has identified a novel invasion suppressor and tumor suppressor gene, HLJ-1. HLJ-1 can suppress cancer cell invasion, migration, colony formation and tumorigenicity. HLJ-1 expression is often low in lung cancer tissue (80%) and its expression is negatively correlated with survival and relapse rates in lung adenocarcinoma patients.

Another novel method is the establishment of microarray analysis tools. The facility has established a comprehensive web server for microarray data analysis and composite regulatory signature discovery. This system integrates a microarray with

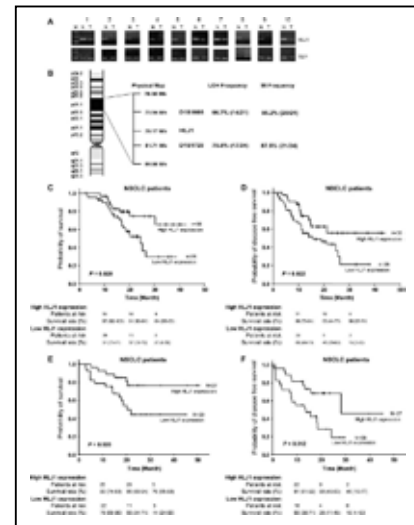
transcriptional factor and microRNA regulatory pathway analysis. The software is available on our website (<http://biochip.nchu.edu.tw:8080/SpecificDB/mou>).

The 16-gene signature and survival of patients with NSCLC (A. training set; B. testing set; C. Risk Index of patients and 16-gene expressions).



The lab has also developed methods for the identification of gene-based lung cancer prognostic signatures. Current methods are inadequate for predicting outcomes of treatment for non-small cell lung carcinoma. The lab developed a 5-gene signature that predicts survival of patients with NSCLC. Gene expression in 125 specimens of surgically resected NSCLC was studied by microarray and real-time reverse transcriptase polymerase chain reaction, and the results were compared with survival rates. Risk score and decision tree methods were used to develop a gene expression model capable of predicting outcomes of treatment for NSCLC. The results were validated in an independent cohort of 60 patients and a published dataset of 86 samples.

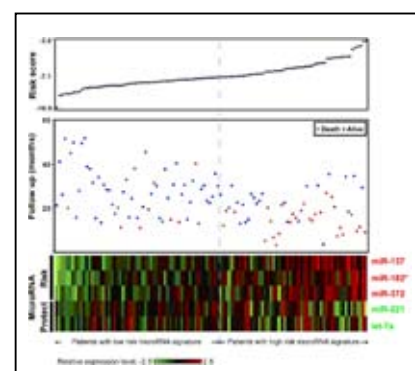
Patients with high expression of HLJ1 had longer overall survival and disease-free survival than patients with low expression.



The Microarray Core Laboratory began two new research projects in 2009. One is the establishment of quantitative gene mutation detection in cancer by MALDI-TOF DNA mass spectrometry platform. This platform will be used for specific pathogen identification in clinical specimens. The other is the establishment of a next-generation sequencing system for genome-wide association studies.

These advanced strategies will not only promote personalized medical care and provide effective treatment in this post-genome era; they will provide outstanding research results in academic areas.

MicroRNA Risk-Score Analysis of 112 NSCLC Patients. (Upper Panel) MicroRNA risk score distribution. (Middle Panel) Patients' survival status. (Bottom Panel) Color-gram of microRNA expression profiles of NSCLC patients; rows represent high-risk and protective microRNAs, and columns represent patients.

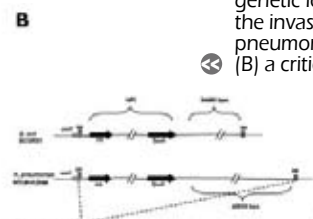
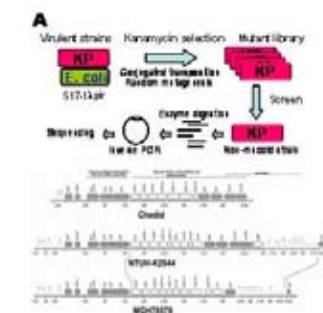




Microbial Genomics Core Laboratory Uses Genomic Approaches to Study Infectious Diseases

The Microbial Genomics Core Laboratory was established to help exploit and expand clinical phenotypes and bio-samples databanks for the exploration of the unresolved problems of infectious diseases by genomic approaches.

To achieve this goal, the core lab has long focused on several infectious disease related issues. It works on the development of sensitive/accurate platforms for efficient detection and quantification of treatment responses and clinical outcomes related to genetic variants for the microbes prevalent in Taiwan. The lab applies newly developed technologies for epidemiological and clinical studies in the search for disease progression and treatment responses associated with genetic variations for further clinical application. It also pursues



(A) Identification of the genetic locus associated with the invasiveness of *Klebsiella pneumoniae* in Taiwan; and (B) a critical 76-kilobase pair

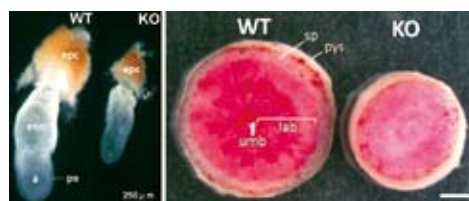
the establishment of animal models for human infectious diseases and studies the genomic evolution of pathogenic microbes for specific infectious diseases. The development of new platforms for the detection of unknown pathogens that cause emerging infectious diseases is another major issue to the lab.

The current direction of the Microbial Genomics Core Laboratory is to apply its new platforms for the sensitive detection and identification of causative pathogens from clinical specimens with unknown

pathogens, which is one of the key issues for the understanding of newly emerging infectious diseases. Moreover, the identification of serum markers for the sensitive prediction of the occurrence of infection related cancers is another topic under intensive investigation. In addition to research and development activities, the lab has provided a variety of services for the researchers at NTU and other institutions. The further development of the Microbial Genomics Core Laboratory will help in clarifying and making breakthroughs on important unsolved problems of infectious diseases.

Effective Gene Targeting Service Earns International Acclaim for Gene Knockout Mouse Core Laboratory

The reduced sizes of the KO embryo and placenta show the growth defect is associated with gene C function. (left) The embryos of WT and KO at E7.5; the KO embryo is recognizable by its smaller size. (right) That the KO placenta is smaller and pale, and its umbilical vessels disorganized, coincides with the smaller embryo on the left.



Prof. Lin Shu-wha of the College of Medicine's Department of Clinical Laboratory Sciences and Medical Biotechnology and her research team started using gene knockout mice to conduct research into gene functions in 1995. The team ultimately spawned a special research team dedicated to animal models for human diseases. Prof. Lin also began working with the Center for Medical Excellence on

the planning and establishment of the Gene Knockout Mouse Core Laboratory in 2002. Since then, she has successfully created over 80 varieties of knockout mice. Underscoring the international acclaim Prof. Lin has earned, the University Of Washington at Seattle contracted her team to provide gene targeting services.

The knockout mice created by Prof. Lin's team include a mouse with abnormal blood platelets that can

be used for cardiovascular research, a mouse that cannot destroy cancer cells and lacks immunity to the metastasis of cancer cells, a mouse exhibiting slow learning and weak memory abilities and a mouse with abnormal embryonic development. These research achievements were published in such eminent journals as *Blood*, *Journal of Neuroscience* and *Journal of Biological Chemistry*.

While the mouse is the most commonly used animal for mammal research, the cracking of the mouse's genetic code and discovery of its similarity to that of humans has made the little animal even more vital to research into human gene functions.



NTU Biodiversity Research Center Co-sponsors First Cross-Strait Biodiversity and Forest Conservation Conference

The NTU Biodiversity Research Center co-sponsored the First Cross-Strait Biodiversity and Forest Conservation Conference in Dehua, Fujian Province, China, from July 27 to 29, together with the Chinese Academy of Sciences, State Forestry Administration of China and Daiyunshan National Nature Reserve in Fujian. During the three-day conference, more than 250 professionals listened to 40 speakers from Taiwan institutions, including NTU, Tunghai University, Academia Sinica, Tainan Science and Technology University and Lunghwa University of Science and Technology, and such Chinese institutions as the Chinese Academy of Sciences, Beijing University and Fudan University.

Conference topics included: long-term ecological sites and soil biodiversity research in Taiwan; sources and sinks of greenhouse gases, biomass energy, soil functional diversity and sustainable development of forestry in Taiwan; phylogeography of mammals in Taiwan and Fujian based on molecular data; division of scenic-recreational forest species based on zonal vegetation; compositions and geographical elements of vascular plants in Castanopsis fabric; and spatial distribution pattern of dominant trees of Castanopsis fabric community in Daiyun Mountains.

Daiyunshan is the first mountain range west of the Taiwan



Scientists from Taiwan and China attend the First Cross-Strait Biodiversity and Forest Conservation Conference, which was co-organized by the NTU Biodiversity Research Center.

Strait and shares many similarities of species and ecosystems with the Central Mountain Range of Taiwan. Experts from Taiwan and China agree that extensive cooperation in research and protection for the two mountain ranges could lead to great contributions for biological diversity and sustainable development.

Students in Professional Knowledge Enhancement Program Enjoy Time Together at Completion Ceremony

The NTU School of Professional and Continuing Studies held a course completion ceremony in the International Conference Hall for students who recently completed the Professional Knowledge Enhancement Program. This was the first time the school held such a large-scale completion ceremony. Over 300 students and instructors packed the conference hall, making the festive night a standing-room-only event.

Speaking at the opening of the ceremony, NTU Financial Vice President Ming-je Tang extended his hearty congratulations to the

students and encouraged them to never lose hope or give up on themselves while on temporary leave from their jobs. He said this is the time for them to be even more active in cultivating their professional knowledge. Vice President Tang also thanks the university's instructors for participating in the program and to Chunghwa Telecom for providing the program's service platform.

The school's director, Andy Ruey-shan Guo, a professor in the Graduate Institute of Business Administration, told the audience that when one door of life closes,

another door must open. He went on to point out that continuing education should not simply be about commerce, with the student taking the role of customer and academia filling the role of supplier. Instead, a balance should be struck between the values of commerce (a source of revenues for schools) and social responsibility (the impact of knowledge).

At the conclusion of the ceremony, each student shook hands one-by-one with the school's faculty and staff before enjoying a spread of tasty food. This provided opportunities for picture taking and reminiscing about the exciting times shared by all.

Wildlife Biologist's Origami Exhibition and Workshops Hosted by NTU College of Life Science

The College of Life Science invited origami artist and field biologist Dr. Bernie Peyton to hold an exhibition of his origami artwork and lead a series of eight workshops on origami folding during NTU's annual Azalea Festival. The inspiration for these events came from Prof. Alex Hontsen Yu's suggestion to Dean of the College of Life Science Grace Chu-fong Lo that the college put on an art exhibit by a scientist. The two had long wrestled with the question of how to make science and its exploration at NTU more accessible to the general public, and this novel idea was deemed an ideal solution.

Dr. Peyton and Prof. Yu were



classmates in graduate school at the University of California, Berkeley. Dr. Peyton developed an interest in origami when he was nine years old and ultimately began folding his own designs in 1998. Due to the wildlife biologist's many years conducting field research and conservation work on endangered species, he makes origami models of animals, which his amazing talent brings to life.

Dr. Peyton has recently begun to pair his origami animals with models of habitat in order to "reflect the importance habitat has for supporting all life forms including humans." Dr. Peyton points out that the art of origami and the scientific process are similar because both require a tremendous amount of mathematics, and because we are surrounded by a folded universe that we study through both disciplines.

For the exhibit, Dr. Peyton displayed 40 origami animals which were grouped according to natural habitat and special themes such as mythology. Ceiling to floor-length banners described the artworks in Chinese

In the corner of the gallery was a message board that became covered in post-its with comments by visitors.



and provided information about the process of creating origami designs. After its run at NTU, the exhibit moved to a gallery at Chiang Kai-shek Memorial Hall, giving even more people the chance to appreciate the creativity and science of Dr. Peyton's art.

Each of the two-hour origami workshops was attended by 25 to 45 participants, including adults and children accompanied by their parents. Dr. Peyton, who said, "origami requires spatial skills, hand-eye coordination and the ability to envision how parts make up a whole," was impressed with the natural ability of the folders at the workshop.

Each of the two-hour origami workshops was attended by 25 to 45 participants, including adults and children accompanied by their parents.



NTU at a Glance

NTU Museums Group Holds Exciting Activities and Exhibitions This Fall



臺大博物館群 大搜查線!
2009.09.07~12.21

活動對象
本校教職員工生、校友、臺大進修班學員及家屬

活動辦法
活動期間內，持活動冊(可於臺大圖書館借閱)前往各博物館參加各項活動，每館至少可獲得一枚印章。集滿十個博物館印章者，可參加抽獎。活動期間內，每日上午九時至下午五時，均可前往各博物館參加各項活動。每人限領一枚印章，數量有限，送完為止。

超值好禮
活動期間內，憑印章可換取：
1. 活動紀念冊(200份)
2. 活動紀念品(100份)
3. 活動紀念品(100份)
4. 活動紀念品(100份)
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8. 活動紀念品(100份)
9. 活動紀念品(100份)
10. 活動紀念品(100份)

查詢詳情請洽：各博物館或活動組電話：http://www.ntu.edu.tw/ntumuseum/

The NTU Museums is an assemblage of the ten museums of the NTU system headed by the NTU Library. While the library plays the lead in this group and is responsible for the planning, coordination and management of the general affairs and publicity of all the NTU Museums through its NTU Museums Office, each museum is self managed. The NTU Museums includes the Gallery of NTU History, Museum of Anthropology, Geo-specimen Cottage, NTU Heritage Hall of Physics, Insectarium, NTU Agricultural Exhibition Hall, Herbarium of National Taiwan University, Museum of Zoology, Museum of Archives and Museum of Medical Humanities.

The NTU Museums actively organizes special activities and exhibitions designed to encourage the members of the NTU family as well as the general public to explore the richness of the university's rich variety of archived resources. One of these activities is the current "Discover NTU Museums," which runs from September 7 to December 21. Guided by a map of the university's museums, participants stroll around the campus on the museums' various scheduled guided tours. At the end of each tour, each visitor receives an ink stamp of the seal of the museum they visited. Participants with nine

stamps then submit a composition of at least 200 words describing their impressions of the museums they visited. Each participant receives a souvenir charm pouch and earns the chance to win exciting prizes.

The NTU Museums and NTU Library also held a special joint exhibition to mark the tenth anniversary of Taiwan's devastating 921 Chichi Earthquake. Located in the Civil Engineering Building, the exhibition ran from September 18 to October 21. Titled "Remembering 921, ten years later: Exhibition of National Taiwan University Research Works Spared from the Quake," the exhibition displayed key documents, artifacts, research projects and digitally-archived resources intended to stir the public to reflect upon themselves and the future by contemplating their experiences of the deadly earthquake and the subsequent reconstruction efforts.

Those interested in exploring NTU's museums will be pleased to know the NTU Museum offers regularly scheduled guided tours of the museums every Wednesday, Thursday and Saturday.

Webometrics Ranking of World Universities Places NTU 26th Globally, Second in Asia

NTU's ranking in the latest Webometrics Ranking of World Universities, published by the Spanish National Research Council's Cybermetrics Lab, rose from 55th place in the previous release to 26th. NTU, which is the only university from Taiwan to appear among the top 100, stood out as well in Asia as second only to the University of Tokyo.

The top 21 spots were all secured by universities in the United States, with the Massachusetts Institute of Technology taking the lead, followed by Harvard, Stanford, UC Berkeley and Cornell. The University of Cambridge ranked 22nd and the University of Tokyo ranked 24th.

The ranking evaluates the web presence of over 6,000 universities around the world in terms of content volume, visibility, richness of files and scholarship in order to promote the presence of universities on the Internet as well as open access to scientific information.



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