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NTU



NEWSLETTER

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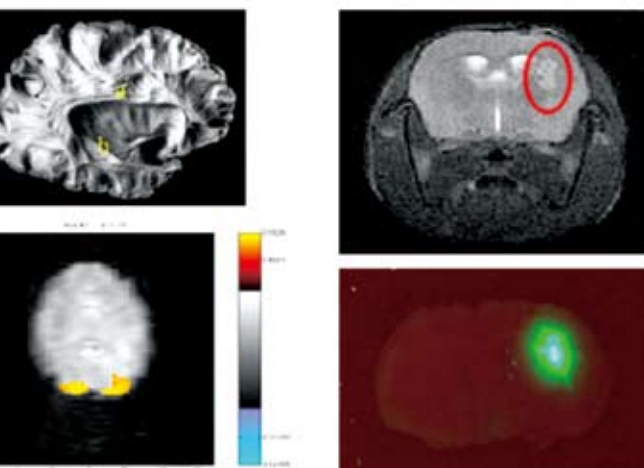
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YongLin Healthcare Foundation Signs Agreement to Fund Establishment of NTU Cancer Hospital in December



President Si-chen Lee (right) and Foxconn-Hon-Hai Chairman Terry Gou (left) share a handshake after exchanging the NTU Cancer Hospital donation contract.

After initially signing a memorandum of understanding with President Si-chen Lee in September 2007 for the donation of a cancer hospital and the development of a biomedical engineering program at NTU, the founder of YongLin Healthcare Foundation Terry Gou took the further step in December 2008 of signing an official donation contract under which the electronics giant's YongLin Healthcare Foundation will work with the university on the construction of a cancer hospital, proton therapy center and biomedical engineering hall. The two parties are also considering future cooperation projects, including a stem cell treatment center.

NTU and YongLin Healthcare Foundation set up a preparatory team that traveled the world to gather information on state-of-the-art cancer treatment philosophy, planning and equipment over last year. The preparatory team also invited leading architectural teams to participate in a design competition, requesting that the architects provide blueprints for the cancer hospital based on prevailing practices in cutting-edge cancer therapy.

Following a number of brainstorming and consensus-building sessions, NTU finally created a prototype for the planning, philosophy, location and architectural design of NTU Cancer Hospital. NTU also formulated plans for the establishment of fundamental clinical cancer research, biomedical



NTU officials pose for a group photo with the founder of YongLin Healthcare Foundation executives at the ceremony.

Models for NTU Cancer Hospital (left) and NTU Biomedical Engineering Hall (right) are unveiled at the ceremony.



engineering research and development and a prevention/screening platform, all for the purpose of promoting interdisciplinary biomedical research. Having selected NTU's Gongguan Campus as the site of the new hospital, this campus will grow rapidly into an advanced biomedical science and technology park.

President Lee pointed out that, in this era of worldwide financial crisis and economic austerity, Mr. Gou's generous donation bears tremendous significance. He also declared that the construction of the cancer hospital stands as the most revolutionary development of the College of Medicine since its establishment over a century ago. The University Council passed a resolution placing NTU Cancer Hospital on an equal footing with NTU Hospital, with both hospitals under the administration of the College of Medicine. In the future, the cancer hospital will enjoy full access to all of the university's biomedical resources. Working hand-in-hand with the YongLin Healthcare Foundation, NTU intends to live up to the expectations of Taiwan's citizenry by establishing a cancer hospital that shares NTU's stated goal of becoming the best in the Chinese world and joining the ranks of the world's best.

Mr. Gou, who said he would increase his donation in the future, believes NTU Cancer Hospital will have a positive effect on shifting the structure of medical resources in Taiwan while spurring innovative research in cancer prevention as well as the development



of biomedical industries. He also emphasized that medical fees at the new hospital will be comparable with those of inexpensive hospitals in Taiwan.

NTU has formulated four guiding principles for the NTU Cancer Hospital.

1. Provide patient-centered services: The cancer hospital will set up case management teams to provide patients with integrated medical care and services, make more effective use of available resources and avoid unnecessary waste and delay.

2. Center planning around diseases: Hospital planning will be aimed at the treatment of tumors in specific areas of the body (such as breast cancer, prostate cancer and lung cancer). Cancer treatment will be undertaken by medical teams using appropriate equipment and procedures for enhanced

professionalism in treatment and care.

3. Establish an open platform: As NTU has the top medical professionals and the best medical technology in Taiwan, it has adopted an open platform philosophy to invite medical practitioners from other institutions to take advantage of its resources, and thereby benefit more patients, physicians and researchers.

4. Strengthen international cooperation: NTU Cancer Hospital will be designed to serve as a teaching and research center for cancer treatment in Southeast Asia. Through participation in transnational clinical experiments, more patients will receive the most advanced cancer treatments.

Webometrics Rates NTU Web Performance 55th Globally, Second in Asia

NTU's web performance, as shown in the Webometrics Ranking of World Universities, continues to improve. The most recent Webometrics ranking, released in January, rates NTU's web performance as 55th globally and 2nd in Asia. In Asia, NTU is approaching the prestigious University of Tokyo, whose 52nd-place global ranking, leaves it only three places ahead of NTU. The 3rd- and 4th-ranked universities in Asia are Kyoto University at 78th and Peking University at 117th.

During the past three years, NTU's Webometrics ranking has risen steadily. While the university garnered rankings of 170th in the world and 5th in Asia in January 2006, it entered the ranks of the world's top one hundred universities, at 96th place, in July 2007, and has held firmly to the 2nd

The screenshot shows the 'Ranking Web of World Universities' website. The 'Top Asia' section is highlighted, showing a list of universities ranked by continent. National Taiwan University is circled in red, indicating its position as the 2nd ranked university in Asia.

CONTINENT RANK	UNIVERSITY	COUNTRY	WORLD RANK
1	University of Tokyo	Japan	52
2	National Taiwan University	Taiwan	55
3	Kyoto University	Japan	78
4	Peking University	China	117
5	University of Hong Kong	Hong Kong	121
6	National University of Singapore	Singapore	135
7	Kao University	Taiwan	152
8	Chinese University of Hong Kong	Hong Kong	156
9	Hebrew University of Jerusalem	Israel	169
10	National Chiao Tung University	Taiwan	179
11	Seoul National University	South Korea	182
12	Korea Advanced Institute of Science & Technology	South Korea	204
13	Technion Israel Institute of Technology	Israel	208
14	Nagoya University	Japan	216
15	Tel Aviv University	Israel	235

spot in Asia since January 2007.

The Webometrics Ranking has been published by the Cybermetrics

Lab of Spain's National Research Council since 2004. Updated rankings are released every January and July.



President Lee Leads Delegation of Taiwan's Top University Presidents on Official Visit to UK Universities

President Si-chen Lee led an educational exchange delegation consisting of the presidents of eight elite Taiwanese universities to universities in the United Kingdom from November 29 to December 3. The delegation was organized at the joint invitation of the British Council and the Ministry of Education's Bureau of International Cultural and Educational Relations. While President Lee acted as delegation leader, he was accompanied by Dr. Ovid J. L. Tzeng, a minister without portfolio of Taiwan's Executive Yuan who has served as minister of education, in the role of honorary delegation leader.

Other important members of the delegation included NTU's Deputy Dean of International Affairs Hu Jer-ming, Director General Ching-jen Liu of the MOE's BICER, Sophia Hsiang-ping Ma, who is secretary to Minister Tzeng, British Council Director Christine Skinner and *Cheers* magazine Editor-in-Chief Feng-chen Liu. National Yang Ming University, National Tsing Hua University and National Chiao Tung University were among the eight universities whose presidents joined the delegation. This large delegation of heavyweights made this an unprecedented education exchange trip for Taiwan.



Attendees at the British Council's Going Global 3 conference

The delegation's first stop was at the London School of Economics and Political Science. The school's Asia Research Centre runs the Taiwan Research Programme, which is the only program of its kind in an English-speaking country to dedicate its research to Taiwan. The program's convener is NTU alumni Dr. Fang-long Shih. The delegation held talks with the program's team in hopes of establishing closer ties.

Next up was King's College, where the delegation met with Principal Rick Trainor and other college officials. Close relations already exist between NTU's College of Liberal Arts and King's College's School of Arts and Humanities as well as between the two institutions' medical colleges.

On the second day, the dele-

gation visited Imperial College and held cooperation discussions with the college's rector, Sir Roy Anderson.

Later that day, the delegation was received by the University College of London's Vice Provost Michael Worton. UCL is famed for accepting students from abroad and currently hosts 4,500 students, accounting for nearly a third of its enrollment, from 130 nations.

The third day focused on a visit to Oxford University to meet with Vice Chancellor John Hood and other officials. NTU is proud to count almost ten Oxford graduates among its faculty members. NTU's Department of Anthropology and Graduate Institute of Anthropology have already established cooperative relationships with Oxford.



President Si-chen Lee appears with members of his delegation to the UK (left), and at Kings College (center) and Imperial College (right).



NTU Again Presents Most Papers Among World Institutions at IEEE IC/SOC Conference in February



Ⓐ Taiwan as a whole produced 18, or 9 percent, of the 204 papers chosen for presentation at ISSCC 2009.

The 2009 IEEE International Solid-State Circuits Conference took place in San Francisco from February 8 to 12. ISSCC serves as an important stage for the presentation of advanced trends in research and development on solid-state circuits and systems-on-chips as well as mainstream developments in the global semiconductor industry. ISSCC selected ten papers produced by NTU for presentation at this year's conference, making this the fifth consecutive year NTU has been the institution to present the highest number of papers at ISSCC.

Taiwan as a whole produced 18, or 9 percent, of the 204 papers chosen for presentation at ISSCC 2009. This placed the country second only to Japan in East Asia for the greatest number of papers presented at ISSCC this year.

NTU's ten papers demonstrate not only the outstanding talent of its faculty and students, but also the staunch support the university receives from Taiwan's semiconductor industry. Since ISSCC 2007, the papers presented by NTU have been mostly the research achievements of the NTU-Mediatek Wireless Research Lab and TSMC University Shuttle Program. This trend continued this year, with six papers being produced by the NTU-Mediatek Wireless Research Lab and four by the TSMC University Shuttle Program.

Most of the NTU papers selected for presentation at ISSCC 2009 pertained to cabled transmission, with topics including 65-nanometer process high-frequency Phase-Locked Loop (PPL) technology,

65-nanometer process leakage current suppression techniques, 130-GHz frequency dividers, 20Gbps full-rate linear time clock data recovery, ultra-low noise clock generators and millimeter multi-mode frequency dividers. In the area of wireless research, NTU presented a paper on systems-on-chips for 60-GHz transceivers, while in the digital area the university's papers introduced new HDTV image encoders, biomedical digital processors as well as systems-on-chips for medical transmissions.

ISSCC 2009 adopted "Adaptive Circuits and Systems" as its theme, and discussions focused on exploring the continual progress made by the semiconductor industry in the field of nanotechnology, a progress evidenced in the areas of signal processing, data storage, micro-power consumption and wireless communication systems. As a result of these technical breakthroughs, the complexity of related electronic circuitry continues to increase. With the growing popularity of integrated systems-on-chips in recent years, the number of transistors on an SOC can easily amount to more than 1 billion after all sub-circuits are integrated into the chip.

In the run-up to ISSCC 2009, conference organizers held a special press conference in Taipei on November 26 to announce the amazing achievements made in Taiwan in the area of solid-state circuitry. This provided an opportunity for major players from various circles of the solid-state circuit industry to gather and share knowledge and conduct technological exchanges.



International Students Experience Chinese New Year Festivity with NTU Host Families

Chinese New Year is not merely a time for festivities, more importantly it is a time for family gatherings and carrying out age-old traditions to welcome a brand new year. In order to provide NTU's international students an authentic CNY experience, the Office of International Affairs began offering its NTU Host Family program during Chinese New Year in 2008.

Chinese New Year's Eve fell on January 25 this year. The holiday

their Taiwanese host families.

Alex Rosenkrantz, who joined a host family in Kaohsiung City for nine days in 2008, said, "I recommend it to anyone who wants to meet Taiwanese people,



Tuvshintugs, from Mongolia, said that apart from enjoying delicious food, one of the most important things he gained from his host family was learning their way of raising children.



The OIA hopes that offering the NTU Host Family program at Chinese New Year will not only provide students with first-hand experiences of Taiwanese culture, but also allow them to be part of a Taiwanese family during the most important holiday in all Chinese-speaking societies. The memorable experiences of last year's participating NTU international students have been produced into a video which is viewable at http://tw.youtube.com/watch?v=WAS_wX2eQsE.



learn about Taiwanese culture, eat delicious food, practice speaking Chinese, explore Taiwan or just have a good time. This Host Family event has given me the opportunity do all of these things and to meet some great new friends."

Muhammad Rizki Ramadhani had a great time as well. He joined his host family in Pingtung and traveled around with them for the holidays. On the last day, he cooked traditional Indonesian food for the family as a gift for them. "Attending the host family event gave me a lot of experience, knowledge and a friendship network. I could visit a beautiful place in the southern part of Taiwan, learn a lot about Chinese culture and also interact with the local people who are very friendly," he said.

lasts fifteen days until the Lantern Festival. In order to welcome the Year of the Golden Ox (the Golden Chinese zodiac returns every 60 years), NTU international students from Russia, Mongolia, Japan, China, Indonesia, India, Thailand, Malaysia, the United States, France, Chile, Peru, Nepal, Italy, Austria, the Netherlands and Turkey signed up to stay with NTU Host Families during this year's Chinese New Year. Students who took advantage of this program in the Year of the Golden Mouse last year were all very impressed by the traditional practices and familial kindness of





NTU Launches New Visiting Student Program to Benefit NTU and International Students

The Office of International Affairs launched the NTU Visiting Student Program in December, a move that will benefit NTU and overseas students alike by providing a new pathway for studying abroad.

The Visiting Student Program is designed to compliment the NTU Exchange Program, which has continued to prove a success over the years. In the fall semester of 2008 alone, NTU saw 151 outgoing exchange students and 157 incoming students. The cooperating exchange universities, although steadily on the increase, are barely enough to satisfy the massive demand among students.

With the Visiting Student Program in place, NTU students are able to go on study abroad programs overseas during academic semesters on a fee-paying basis. The options are no longer restricted to partner universities, nor are they affected by exchange imbalances. On the other hand, the program allows NTU to accommodate

students from non-partner universities who wish to study in Taiwan for up to one academic year. The incoming visiting students will have the same eligibility as exchange students, but are responsible for their own tuition, fees and charges for Chinese language courses.

Since the launch of the program, the number of cooperating universities has reached 12. Prestigious institutions in the United Kingdom, the United States, Europe and Australia, including the University of Oxford, London School of Economics and Social Science, King's College London and University of Illinois, are among these universities.

The newly-established program has received an impressive volume of inquiries from students all over the world, while local students have also expressed keen interests in taking advantage of this long-awaited opportunity to go abroad.

Application Information Session for International Degree Students Attracts Over Twice as Many Attendees as Previous Year

The Office of International Affairs held the "2009/10 International Degree Program Information Sessions" on the NTU main campus on December 16 -17. The sessions sought to provide international students with practical information about pursuing degrees at NTU and help the university achieve its goal of boosting the number of international degree students. The sessions drew an exceptionally large number of students currently enrolled in NTU's International Chinese Language Program.

The OIA received a strong positive response to its decision to conduct sessions in Mandarin and English for the first time in 2007, so it continued the practice again this time. The office invited representatives from departments in which international students have shown the most interest, namely, Chinese literature, law and business management, to provide information and answer questions.



International students attend one of the "2009/10 International Degree Program Information Sessions."

Compared to the previous year's sessions, the number of attendees at the Mandarin session increased 160 percent while the number at the English session rose 130 percent. Interested students from South Korea, Indonesia and the United States accounted for the top-three nationalities at the Mandarin session, while those from Indonesia, India and Central and South America made up the top-three nationalities/regions at the English session.

NTU will be accepting applications from international students for the 2009/2010 academic year until March 13. Those interested in submitting applications can find more information at http://www.oia.ntu.edu.tw/degree/admission/200910/en/app4.asp?mc=C_00000177&mz=C_00000092.



Iran's IROST Names Two Female NTU Professors as Laureates of 22nd Khwarizmi International Award in February

Two female NTU scientists, Prof. Li-chyong Chen and Prof. Su-may Yu, were named laureates of Iran's 22nd Khwarizmi International Award, and received their awards in person from Iranian President Mahmoud Ahmadinejad at the 22nd Khwarizmi International Festival 2009 on February 3.

Prof. Chen is a distinguished research fellow at the Center for Condensed Matter Sciences. In addition to being named a KIA laureate, Prof. Chen was also presented with an IFIA Lady Prize by the International Federation of Inventors' Associations. The IFIA Lady Prize was presented to the woman presenting the best invention at the 22nd Khwarizmi International Festival 2009.

Prof. Yu is an adjunct professor in the Department of Agronomy as well as a research fellow at Academia Sinica's Institute of Molecular Biology. Prof. Yu was also named Best Woman Scientist for Innovation by the World Association of Industrial and Technological Organizations at the KIA Festival.

The organizers of the 22nd Khwarizmi International Award received a total of 141 international entries, and only 13 of these received awards. Prof. Chen and Prof. Yu were the only two women scientists named KIA laureates this year. In 2008, NTU's Prof. Chung-chih Wu of the Department of Electrical Engineering became the first Taiwanese to be named a KIA laureate.

The Iranian Research Organization for Science and Technology established the KIA to acknowledge outstanding achievements by Iranians in science and technology in 1987. However, it became an international award in its fifth year. International organizations such as WIPO, UNESCO, IFIA, COMSTECH, COMSATS, TWAS, ISESCO and WAITRO have sponsored the KIA since its tenth year.

Dr. Chen won her KIA in nanoscience and technology for her achievements in developing hybrid nanomaterials for high-performance optoelectronics, sensing and energy applications. Her main



Prof. Li-chyong Chen shows off her Khwarizmi International Award (right) and IFIA Lady Prize (left).

accomplishments involved working with carbon nanotubes and their hybrids, metal-dielectric nanopeapods, biomimetic silicon nanostructures and GaN nanowires and nanobridges.

Prof. Chen earned her B.S. in Physics from NTU and then went on to receive her Ph.D. in Applied Physics at Harvard University in 1989. She also received an honorary doctorate from Sweden's Linköping University in 2007. Prof. Chen worked at General Electric's Global Research Center in New York from 1989 to 1994. She now heads the CCMS's Advanced Materials Laboratory, supervising over 40 members in her group. Her research interests span a broad range of nanomaterials, including carbon nanotubes, group III-nitride nanowires, silicon nanotips, metal-dielectric nanopeapods and related hybrid nanocomposites.

Dr. Chen holds eight patents and has published over 208 papers in internationally refereed journals, including *Nature Material* and *Nature Nanotechnology*. A number of her papers have been listed as highly-cited papers by ISI. Dr. Chen has served on the editorial board of *Critical Reviews in Solid State and Materials Sciences* since 2004 and was an associate editor of the *Journal of Vacuum Science and Technology B-Microelectronics and Nanostructures* from 2004 to 2006.



Literature Professor Chia-ling Mei Wins 2008 National Award for Distinguished General Education Teachers

Prof. Chia-ling Mei of the Department of Chinese Literature was named among the five professors in Taiwan to be awarded the Second Annual Distinguished Award for General Education Teachers in 2008.



Prof. Chia-ling Mei speaks on behalf of the recipients of the 2008 Distinguished Award for General Education Teachers.

The recipients were chosen through a rigorous review conducted by a panel of scholars from 11 disciplines in which 69 candidates recommended by public and private universities and colleges in Taiwan were considered. The presentation ceremony for the award was held on December 24 during the National Conference of University Presidents. Minister of Education Dr. Jui-cheng Cheng personally presented a certificate of merit, an award trophy and a cash prize of NT\$200,000 to Prof. Mei and the other winners in recognition of their outstanding contributions to the general education at NTU.

Upon receiving the award, Prof. Mei pointed out that general education is a key that opens doors for students in their learning of professional skills and

Minister of Education Dr. Jui-cheng Cheng presents Prof. Chia-ling Mei with her Distinguished Award for General Education Teachers trophy.



allows students to begin to discern the rich diversity of the universe and the charm of literature and art. She added that general education helps students become aware of the meaning and value of being a person with emotions and feelings and the unlimited possibilities awaiting them outside of the pursuit of professional skills.

Prof. Mei's areas of specialization include modern literature, Taiwanese literature and the literature of the Six Dynasties. She earned her bachelor, master and doctoral degrees all from the Department of Chinese Literature at NTU. Prof. Mei has taught NTU general education courses as well as freshmen Chinese for NTU common courses from 1987 to the present, and has been convener for the area of "literature and art" in NTU's general education curriculum since 2006.

Prof. Mei has amassed numerous academic honors, including the 2001 Excellent Webpage Award for NTU Asynchronous Teaching, 2003 Ministry of Education Award for Individual Merit-Based Program of General Education Courses (1st semester), 2004 Ministry of Education Award for Individual Merit-Based Program of General Education Courses (1st semester), 2006 Ministry of Education Award for Individual Merit-Based Program of General Education Courses (1st semester), 2006 NTU Award for Individual Merit-Based Program of General Education Courses (1st semester), 2007 NTU Award for Individual Merit-Based Program of General Education Courses (1st semester), 2004 NTU College of Liberal Arts Outstanding Teacher Award, 2006 NTU Excellent Teaching Award, 2007 NTU Outstanding Teacher Award, 2003 National Science Council Major Professor Award for College Students' Special Topic Research Plans (which she won again in 2004 and 2005) and 2003 National Science Council Award for Masters Theses.

In addition, Prof. Mei received a grant from the China Development Fund to teach at universities in China, and was invited as a visiting professor to teach at Charles University of the Czech Republic, Tsinghua University of Beijing and Heidelberg University of Germany.





IEEE Names Two More Professors from College of Electrical Engineering and Computer Science as Fellows

Profs. Chi-kuang Sun and Char-dir Chung, both of the College of Electrical Engineering and Computer Science, were named as Class of 2009 Fellows by IEEE, the world's leading professional association for the promotion of technology, in mid-November. While this is a personal professional honor for these professors, it also brings greater prestige to the college by raising the total number of the college's IEEE fellows from 22 to 24, more than any peer college in Taiwan. The college has had professors elected to IEEE fellowships each of the last ten years.



Prof. Chi-kuang Sun (left) and Prof. Char-dir Chung (right)

team made many technological breakthroughs and holds a leading position in its field. The team is the first in Taiwan to have a paper published

in *Nature Nanotechnology*. Prof. Sun also is a Fellow of the Optical Society of America, the Royal Microscopical Society of London and SPIE.

Prof. Chung, a professor in the Graduate Institute of Communication Engineering and Department of Electrical Engineering, was named to an IEEE fellowship "for leadership in the broadband wireless communications industry." In recent years, Prof. Chung has concentrated on digital modulation theories, and has proposed unified signaling formats and defined four multi-dimensional orthogonally multiplexing modulation families. Moreover, by working closely with government and industry, he has made outstanding contributions to the development of the broadband wireless communications industry in Taiwan.

Prof. Sun, a distinguished professor in the Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, was elected to an IEEE fellowship "for contributions to high resolution medical microscopy and nano ultrasonic imaging." His primary research areas include: femtosecond optics, ultrafast phenomena, noninvasive optical microscopy and manipulation for biomedicine, ultra-high bandwidth optoelectronics and nano ultrasonics. Prof. Sun's research



International Association for Management of Technology Lists Business Administration Prof. Chung-jen Chen among Top-50 Researchers in Technology Management

Prof. Chung-jen Chen of the Department of Business Administration has been listed by the International Association for Management of Technology among the world's 50 best researchers in the field of technology innovation management. Prof. Chen will travel to the United States to be honored with an award along with other leading international academics at an official IAMOT ceremony in April.

IAMOT presents its technology innovation management research awards based on the number of

papers a researcher has presented in the ten leading journals in the field of technology innovation management, including IEEE Transactions on Engineering Management, R&D Management, Research Policy, Research Technology Management and Technological Forecasting and Social Change, during the past five years. Award winners are the top-50 researchers, among thousands that publish in the field, who have published the most papers in these leading journals over the past five years. Each of the papers presented in these ISI-indexed journals passed rigorous reviews and underwent peer evaluations by professional evaluation committees. The winners

of this year's award come from 14 countries.

Prof. Chen, who earned his Ph.D. from Rensselaer Polytechnic Institute in the United States, specializes in technology and innovation management and strategic management. His research is focused primarily on technology and innovation management, knowledge management, strategic alliances and the development of the high technology industry, and he has published over 20 papers in academic journals over the last five years. Prof. Chen is currently the editor of two academic journals and on the editorial board of a third.



College of Medicine Makes International Breakthrough Using MRI to Predict Leukemia Survival

Profs. Tiffany Ting-fang Shih and Hwei-fang Tien of the College of Medicine held a press conference on January 14th to present their research team's findings on the use of dynamic contrast-enhanced magnetic resonance imaging to predict treatment outcomes for patients suffering from acute myeloid leukemia. By applying an innovative analytical model for conventional bone marrow MRI scans, the team was able to predict accurately the effectiveness of treatment and patient survival. This is a quick, noninvasive imaging method that permits repeated measurements. Considered an international breakthrough, the findings were published in the world's leading hematology journal, *Blood*, under the title "Bone marrow angiogenesis MR imaging in patients with acute myeloid leukemia: Peak



Ⓐ Prof. Jyh-horng Chen of the Department of Electrical Engineering and Profs. Tiffany Ting-fang Shih and Hwei-fang Tien of the College of Medicine (front row, left to right) pose with members of their research team.

enhancement ratio is an independent predictor for overall survival," and first appeared on the journal's website on November 6.

This noninvasive, *in vivo* method may allow patients to avoid painful biopsies and exposes them to no radioactivity, yet provides information concerning marrow blood flow over a large area. It can be used to



Ⓐ The press conference for this NTU imaging breakthrough drew a large media attendance due to its potential impact on health and medicine.

detect the number of abnormal blood vessels and measure vascular permeability and changes in the functioning of blood vessels. Furthermore, the method can measure changes in angiogenesis-the formation of new blood vessels-and blood flow around cancer cells before, during and after treatment, and is therefore a powerful tool in determining the effectiveness of leukemia treatment.

Prof. Shih said that, as the bone marrow is sealed within the bone cavity, it is very difficult to measure blood flow within the marrow. One of the greatest advantages of this evaluation technique is its predictive capacity. For instance, for patients who exhibit only slight changes within their marrow, the technique can be used early on to evaluate any abnormalities in angiogenesis in order to make predictions regarding the possibility of the situation advancing to the stage of leukemia. It can also predict how a particular patient will likely respond to treatment. This means the technique may help identify high-risk patients and allow physicians to develop customized anti-angiogenic therapy and monitor treatment responses.

Prof. Shih also affirmed that it might be possible to extend this innovative method to the detection and diagnosis of other forms of cancer. For liver cancer patients, for example, the method could be used to assess angiogenesis within just two to seven days of the commencement of treatment. If doctors determine that changes have occurred in terms of blood flow or the permeability of blood vessel walls, they can make predictions concerning the future development of the cancer and the effectiveness of treatment at an early stage and make adjustments as needed.

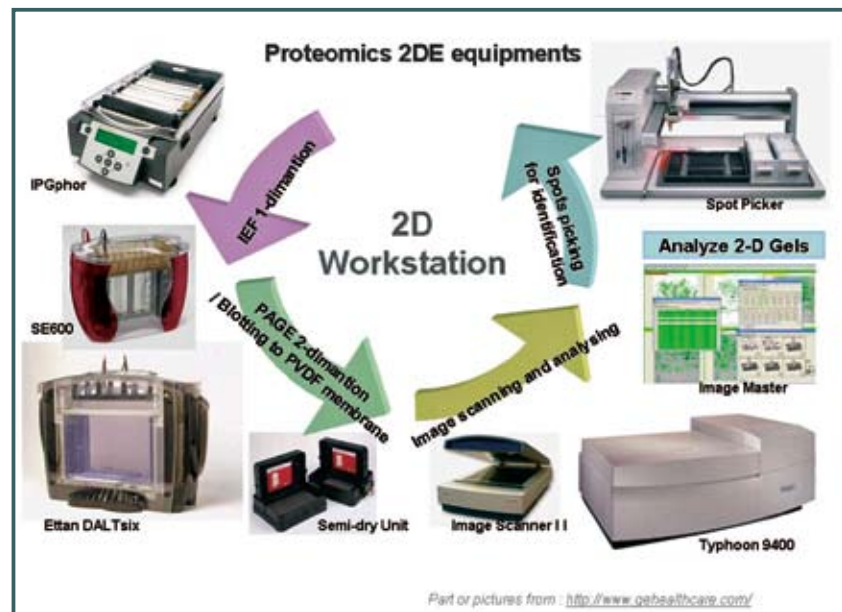


Proteomics and Protein Function Laboratory Working to Identify Components of Cancer and Infectious Disease Proteomes

The following is an introduction to the Center of Genomic Medicine's Proteomics and Protein Function Core Laboratory by the director of the College of Medicine's Institute of Biochemistry and Molecular Biology, Prof. Lu-ping Chow.

The completion of the genomes for a large number of organisms has begun to revolutionize experimental approaches to a variety of problems in biology and medicine. The proteome is of intense interest to investigators because proteins are the major functional components of the cell. In the era of genomic research, characterization of a protein links it directly to its corresponding gene; understanding the function of a particular protein leads directly to gene function.

Proteomics, a subset of functional genomics, is the study of the proteins expressed by an organism. These studies link genome sequence data and gene function. More than 200 proteomics facilities have been established worldwide. As a leading academic institution in Taiwan, NTU's core of services can provide fast, high-sensitivity identification of proteins by mass spectrometry performed with three instruments. MALDI-TOF (Matrix-assisted laser desorption/ionization time-of-flight) mass spectrometry identifies proteins by peptide mass fingerprinting. Liquid chromatography-tandem mass spectrometry (using Q-STAR) enables researchers to analyze post-translational modification, using monosaccharide analysis,



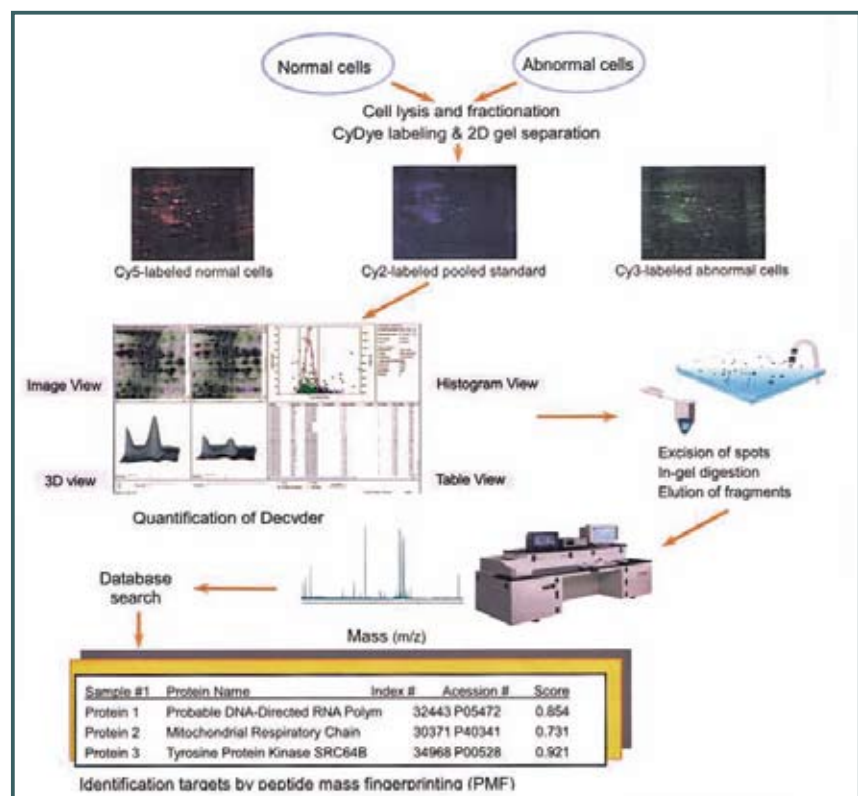
Proteomics two-dimensional electrophoresis (2-DE) equipment

oligosaccharide profiling, glycosylation sites and detection of phosphorylated amino acids.

consultation and support for protein separation techniques, proteome-related bioinformatics and data management. Our ongoing projects are designed

Furthermore, the facility offers

Proteomics mass spectrometry (MS) equipment

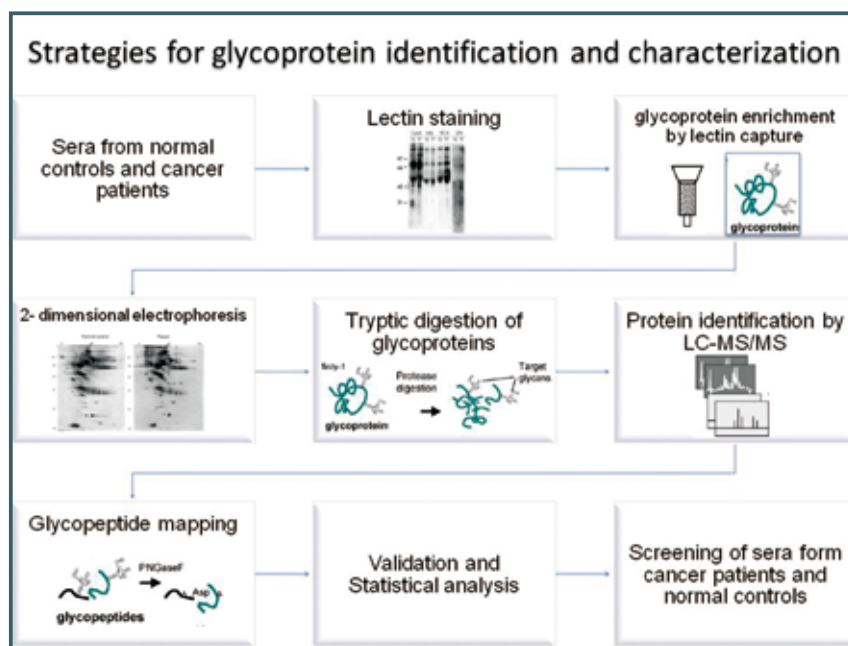




to identify all the components of cancer and infectious disease proteomes, providing a basis for functional studies. We will also address identification of functional components of selected subcellular components. The overarching goal of achieving new understanding of diseases should yield important new targets for therapeutic interpretation and markers for early detection as well. The stated mission of the Proteome Core Facility is to provide comprehensive technological support for biomedical research, both basic and with potential clinical applications, on topics ranging from cancer and pathogenesis of infectious diseases to drug and vaccine design.

The laboratory's services include:

1. Two-dimensional electrophoresis (2-DE) analysis (CBB, Silver Stain, Ruby, Cy3/Cy5 Label)
2. Protein digestion (in gel, in solution)



Strategies for glycoprotein identification and characterization

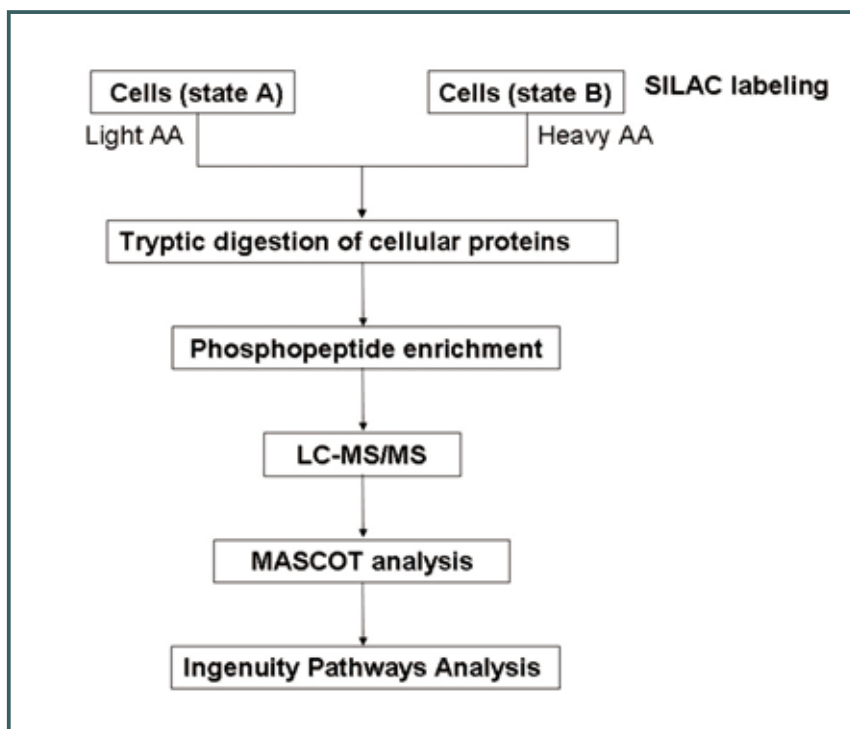
3. Identification of molecular weight of protein (peptide) by mass spectrometry (MALDI-TOF)

4. Identification of peptide sequence (LC-MS/MS)

5. Prediction of unknown protein by mass spectrometry database search

with MASCOT software (MALDI-TOF, LC-MS/MS)

Some of the latest publications produced by the laboratory include "Secretome analysis of novel IgE-binding proteins from *Penicillium citrinum*" (*Proteomics-Clinical Applications* 2: 33-45, 2008) and "Duodenal ulcer-related antigens from *Helicobacter pylori*: immunoproteome and protein microarray approaches" (*Molecular & Cellular Proteomics* 6: 1018-1026, 2007).



Strategies for phosphoprotein identification and characterization



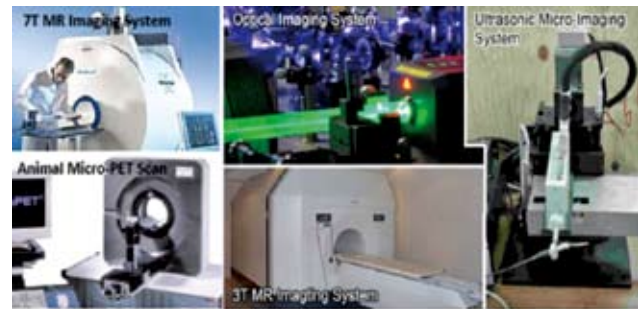
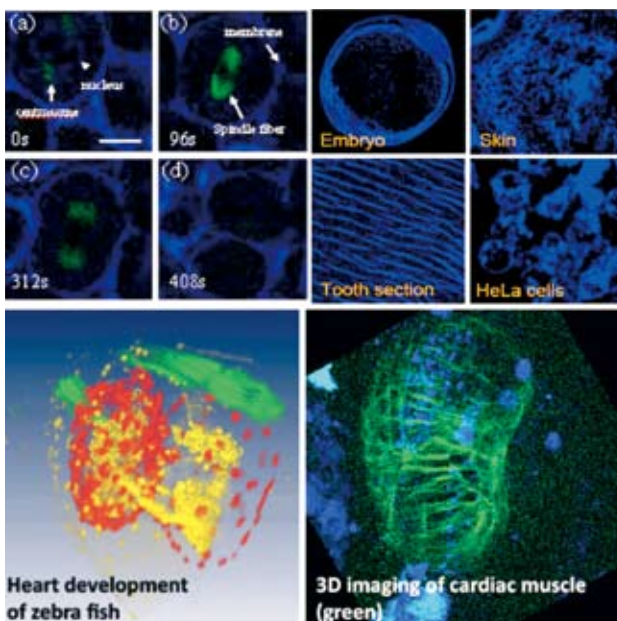
Biomedical Molecular Imaging Core Laboratory Observes Critical Gene Activity *in vivo*

Biomedical molecular imaging is a technology that combines molecular biology and clinical medicine, and is a field of medicine that shows great promise. Generally, molecular imaging research offers three advantages. First, it can transform complicated processes of gene expression and signal transduction into visual images, enabling the direct observation of disease mechanisms and features. Second, it enables the detection of early-stage molecular variations of diseases and the tracking of their pathologic processes. Finally, it permits continuous *in vivo* observation of the mechanisms and effects of drug and gene therapies. Biomedical molecular imaging integrates molecular biochemistry, data processing, nanotechnology and image processing, and offers the advantages of high specificity, high sensitivity and ultra-high spatial resolution. Therefore, it promises clinical applications in providing accurate data about quality, location and quantification for purposes of diagnosis.

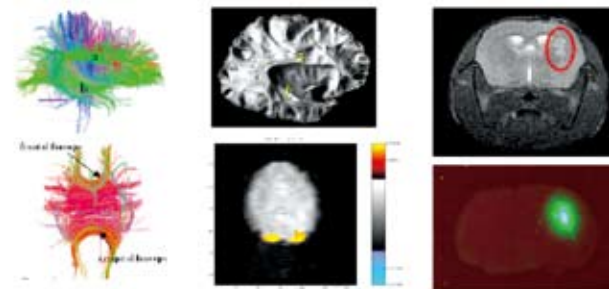
The Biomedical Molecular Imaging Core Laboratory is an integrated core facility established under the Research Center for Medical Excellence in 2006. Prof. Jyh-horng Chen, Department of Electrical Engineering, assembled for the lab a range of molecular imaging modalities, including MRI, optical imaging, ultrasonic imaging and animal micro-PET imaging. The lab's co-principal investigators are experts from a variety of disciplines, including electrical engineering, materials sciences, information sciences and molecular biology.

The lab's optical molecular imaging capabilities can be applied to non-invasive diagnosis and therapy for cancer research as well as the research of gene transfection, gene expression and

embryonic development.



The Biomedical Molecular Imaging Core Lab offers a range of imaging devices.



The lab's instruments are used for the preliminary analysis, quantification and application of MR molecular imaging.

This facility pursues an *in vivo* approach to investigate the functions of critical genes in biological processes, and aims to identify critical genes in biological processes through pathway analysis. Once critical genes are identified, probes targeting specific gene products can be designed for the *in vivo* observation of their functions through fast high-resolution MRI, ultrasonic imaging, 3D optical imaging and micro-PET imaging. The lab's range of imaging technologies can be exploited for clinical diagnosis, therapy research and the study of animal disease models. They provide dynamic molecular imaging with sub-micron spatial resolution and high cell viability and have a high degree of correlation with other imaging modalities.

These imaging technologies allow researchers to monitor specific gene expressions *in vivo* for distinguishing the different behaviours of genes in different environments and at different stages. They are powerful tools for the research of different gene interactions *in vivo*. The lab's nanotechnology and nanomedicine research capabilities also allow it to develop multimodality contrast agents for intravital correlation imaging. Furthermore, the lab's imaging technologies can be used for stem cell targeting and tracking.

These advanced imaging strategies can be extended to many disease models and will promote effective personalized healthcare in this post-genome era as well as reveal genomic status *in vivo* for translational medicine applications.



Center for Biotechnology Compiles Online Teaching and Research Resources for Biotechnology and Genetics into Book

The Center for Biotechnology's division chief for research and development, Prof. Shih-torng Ding, of the Department of Animal Science and Technology and Institute of Biotechnology, has collected 101 biotechnology, genetics and biology related websites and briefly introduced them in a new book entitled, *Introduction to Online Teaching and Research Resources for Biotechnology and Genetics*. Altogether, the book contains 101 websites providing abundant information for learning, teaching and research, as well as valuable online software and databases.

Biotechnology has been an extremely hot topic over the last two decades. Besides drawing interest from government funding agencies, biotech has developed into one of the faster growing areas of industry. Most of the websites selected for this book are related to biotechnology. Prof. Ding chose to introduce Amgen (www.amgen.com), the Biotechnology Institute (www.biotechinstitute.org), Cold Spring Harbor Laboratory (www.cshl.edu), the USDA (www.vvm.cfsan.fda.gov) and NCBI (www.ncbi.nlm.nih.gov) to demonstrate that not only private firms, but also governmental institutions, are interested in providing information for the promotion of biotechnology education and research. "If there is a heaven for biologists, the NCBI/Entrez website must be its gate," he exclaims in reaction to this all-in-one website. The site provides countless data and free software for visitors. The genome data for



various species, cDNA sequences and the free Medline scientific article search engine are among the unique services provided on this website.

As for reliable biotechnology research protocols, there are several valuable websites, including OpenWetWare (openwetware.org/wiki/protocols), Online Protocols (www.protocol-online.org) and Nature Protocols (www.natureprotocols.com). And, since stem cell research has become a white-hot topic, the book introduces the NHI Stem Cell Information website (stemcells.nih.gov/index.asp), which contains information on progress, training and news related to stem cell research.

The Internet contains seemingly innumerable websites related to genetics and genomics. In these areas, Prof. Ding chose websites pertaining to microbial genomics (www.tigr.org/tigr-scripts/CMR2/CMRHomePage.spl), plant

genomics (www.greenomes.org), molecular farming (www.thearkdb.org), the mouse genome (www.informatics.jax.org) and genetics learning (gslc.genetics.utah.edu), as well as the Genetics Gateway (www.horizonpress.com/gateway/genetics.html). He recommends these websites to scholars in all fields of life science.

In the field of biology, the book introduces Biology World (www.Biowww.net), Species 2000 (www.sp2000.org), the Animal Diversity Web (animaldiversity.ummz.umich.edu/site/index.html), Biodidac (biodidac.bio.uottawa.ca) and Natureserve (www.natureserve.org), among others. For biology instructors searching for information and graphics to enrich lectures, Prof. Ding points to Biodidac, Natureserve and Google Images as excellent sources for images of various species, embryos, cells and organelles for non-commercial use. The Biology Project (www.biology.arizona.edu), for its part, provides course contents, pictures, animation and videos for biochemistry, cell biology, human biology, immunology and Mendelian genetics. The contents of these websites are easy to download and use.

The book is available free of charge by contacting Prof. Ding via email (sding@ntu.edu.tw), while an NTU website providing the same information is located at <http://homepage.ntu.edu.tw/~sding/BioTech516/index.html>. Both the book and the website are in Chinese.



After Successful Internships at Thailand's BIOTEC, College of Life Science to Send Students Each Summer

 The College of Life Science's interns at Thailand's BIOTEC spent time backpacking near Chiang Mai with fellow interns from around the world.



The College of Life Science selected seven students who had just completed their sophomore or junior years to take part in ten-week internships at laboratories operated by Thailand's BIOTEC during the summer of 2008. BIOTEC is a genetic engineering and biotechnology research organization under Thailand's National Science and Technology Development Agency that conducts research in areas ranging from agricultural science to biomedical science and environmental science. Due to the success of this initial program, the college and BIOTEC have decided to continue offering these internships every summer.

Under the academic exchange agreement for this internship program, which was inked in 2008, the college agreed to cover the students' travel expenses to and from Thailand, while BIOTEC offered to provide for the cost of accommodation and medical insurance. This part of the agreement allows needy students to participate in the program and enjoy the opportunity to broaden their academic and international outlooks.

The seven internship students were each assigned to one of four BIOTEC laboratories, and conducted research in such areas as transgenic agricultural crops

and malaria. In addition to studying basic molecular biology manipulation techniques, the students learned how to apply their knowledge of molecular biology and genomics in experiments. It is noteworthy that Thailand's biotechnology research tends to be focused on agricultural technology applications. The College of Life Science is impressed with this pragmatic policy of concentrating resources in areas that are of particular importance to Thai society.

Many outstanding students and researchers from around the world are engaged in academic exchanges and research at BIOTEC and other NSTDA research organizations. Thus, students participating in this internship program have the opportunity to meet and exchange information and research experiences with top students from other countries. Furthermore, since Thailand's government has a policy of sending exceptional Thai students overseas to pursue advanced studies and then bringing them back home to carry out research after the completion of their studies, a many of the guidance professors at Thailand's research laboratories are young scientists who earned their



Ph.D.s in Europe or North America. These professors are familiar with international techniques and standards, so the internship students under their guidance gain important practical knowledge through their interactions.

Based on its observations of Thailand's proactive approach to enhancing its technological and academic strengths, the College of Life Science considers Thailand an appropriate reference model for Taiwan to consider in developing its own strengths in technological research and development and academic research. While it is important to engage actively in exchanges with the international community, it is also essential



▲ The College of Life Science's BIOTEC interns pose for a photo during orientation.

that a nation focuses on the integration of its particular strengths with its local needs and works to attract scholars and students in these fields for exchanges and cooperation. This approach would also benefit NTU in achieving its ultimate goal of joining the ranks of the world's elite universities.

Besides taking advantage of these academic opportunities, the internship students also had time to relax and learn more about Thailand by visiting natural and cultural sites together with other international students and local researchers.

UN University Vice-Rector Attends Round Table Meeting on Climate Change at NTU

The Biodiversity Research Center along with the Department of Horticulture hosted a roundtable meeting with United Nations University Vice-Rector Dr. Kazuhiko Takeuchi here at NTU on November 15.

Dr. Takeuchi is a well-known scientist in the global effort toward sustainable development. At the University of Tokyo, he serves as vice president for international relations and deputy executive director for Integrated Research System for Sustainability Science, and is a professor in the Graduate School of Agricultural and Life Sciences. Dr. Takeuchi also works with the Alliance for Global Sustainability and the United Nations Convention on Combating Desertification.

The roundtable was organized by Prof. Chun-yen Chang and entitled "Sustainability on Resource Management in Taiwan." Some key NTU professors at the meeting included Prof. Chang, Prof. Chyi-rong Chiou, Prof. Chia-kuen Cheng, Prof. Hui-mei Chen, Prof. Li Shen and Prof. Yuan-tay Shyu. The roundtable participants were invited to discuss



▲ Dr. Kazuhiko Takeuchi (center), vice-rector of United Nations University and vice president for international relations at the University of Tokyo, chaired a roundtable meeting on "Sustainability on Resource Management in Taiwan" at NTU.

ways of promoting cooperation and development in the area of climate change, urban greens and natural benefits as they relate to health and environment, global education, rural and urban landscape transformations in Asia, ecosystem services on the scale landscapes and regions in Asia as well as planning-based approaches for sustainable landscape development.

United Nations University is an agency of the United Nations established in Tokyo in 1973 for the

purpose of undertaking "research into the pressing global problems of human survival, development and welfare that are the concern of the United Nations and its agencies." The professors taking part in the roundtable meeting with Dr. Takeuchi agreed that some regional cooperation projects on the topics of rural and urban landscape transformations in Asia and biodiversity research could be initiated through the joint efforts of United Nations University and NTU.

NTU at a Glance

傅鐘回響

許倬雲先生臺大講學集

許倬雲◎主講

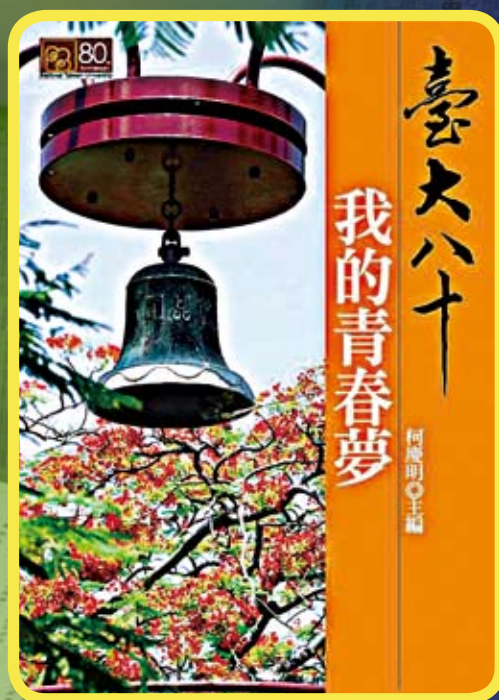
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Eminent Chinese Historian Dr. Cho-yun Hsu Publishes Collection of Lectures Presented at NTU

In December, the eminent Chinese historian, Dr. Cho-yun Hsu, published a collection of eleven special lectures he presented at NTU during 2006. At the invitation of NTU, Dr. Hsu (Class of '53) returned to his alma mater that year to teach nine classes titled, "On Instructional and Research Topics in Chinese Culture," for which he allowed students to select specific lecture topics. He encouraged students to make judgments and draw general conclusions about lecture topics. During this time, Dr. Hsu also gave two public lectures at the request of the Institute for Advances Studies in Humanities and Social Sciences. These lectures were presented under the titles, "Intellectuals in History, Intellectuals of the Future World" and "Diverse Modernity."

LITERARY ALUMNI RECALL DAYS OF YOUTH AT NTU IN BOOK PUBLISHED FOR 80TH ANNIVERSARY

In November, NTU published a collection of writings by over 40 literary alumni recalling their days of youth on this inspiring campus in order to commemorate the university's 80th anniversary. Edited by Prof. Ching-ming Ko of the Graduate Institute of Taiwanese Literature, the book provided each of these poets and writers with the opportunity to share their own unique NTU experiences and stories. It is individual tales such as these that express the essentials of the NTU Spirit. Revolving around themes of youth and dreams and remembrances of the royal palms and azaleas, these writings stand ultimately as reflections on dreams, growth and maturation.



Gallery of NTU History's Range of Offerings Opens Window Wide to University's History

The Gallery of NTU History has worked to preserve and share the artifacts and memories of the university's 80-year history over the nearly four years since its establishment. Operated by the NTU Library, the gallery is located in the former central reading room of the historical and stately old Main Library building. In addition to displaying permanent exhibitions, the gallery also arranges special exhibitions and offers guided campus tours. Moreover, the gallery uses the tools of the digital age for its oral history project and to preserve old alumni photographs, and has even set up a blog space where members of the NTU family can share their NTU experiences.



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