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NTU



NEWSLETTER

February 2012 / No. 28

NTU, U of Tehran Begins Academic Exchanges

Stem Cell Research in Full Gear

NTU Hospital Joins Quintiles to Develop New Drugs

Drunken Moon Lake Renovated

Special Report
Research Ethics Office



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NTU AT A GLANCE

Two Books Inaugurate NTU Press's Literature and Culture of Taiwan Series



From the President's Office

In 1973, Taiwan established the Industrial Technology Research Institute in order to help research institutes and universities transfer technology to industry for product development. While ITRI is an important bridge between industry and academia, it is responsible for the middle and final phases of academia-industry cooperation. As for the initial phases of creation and prototype development, many professors lack assistance from relevant organizations and there are insufficient communication channels with industry.

A professor from the College of Medicine spent five to ten years before finally developing his research into a small portable device that can quickly detect six types of viruses last year. Upon seeing the prototype, the industrial community entered into cooperation discussions with the professor and began making investments. This example led NTU to decide to establish the Creativity Realization Center in order to assist professors and students develop their ideas into product prototypes.

NTU will increase its academia-industry cooperation budget for the purpose of upgrading the Office of Research and Development's Center of Industrial-Academic Collaboration to the Creativity Realization Center. The new center, which is scheduled to open in the first quarter of this year, will pursue a variety of approaches, including coordinating with the university's Creativity and Entrepreneurship Program and creativity competitions in order to spur student creativity.

It is my hope that the center will narrow the gap between innovative ideas and product prototypes, and transform the university's outstanding ideas into prototypes that will attract venture capital that will take these prototypes to the level of commercial products.

李嗣涔

President
Dr. Si-chen Lee

PRESIDENT LEE LEADS DELEGATION TO RUSSIAN ACADEMY OF SCIENCES BRANCH IN VLADIVOSTOK

President Si-chen Lee led an NTU delegation to the Far Eastern Branch of the Russian Academy of Sciences (FEB RAS) in Vladivostok, November 21-24, 2011. The delegation included Dean of Research and Development Ji-wang Chern, Prof. Shih-ming Lin, Center for Optoelectronic Biomedicine, Prof. Chieh-hsiung Kuan, Graduate Institute of Electrical Engineering, and Dr. Chun-fu Lai, College of Medicine.

President Lee initiated the trip on the recommendation of Dr. Min-liang Kuo, associate dean of research and development of the Institute of Toxicology, College of Medicine, as well as director general of the Division of Life Science, NSC. Dr. Kuo, who visited the FEB RAS in 2010, was deeply impressed by FEB RAS's use of magnetoencephalography and the acupuncture energy channels of Chinese medicine to diagnose diseases, and suggested that NTU pursue academic cooperation with FEB RAS.

President Lee and his delegation were received by FEB RAS Vice Presidents Yuri N. Kulchin and Vladimir Chumakov, International Office Director Vladimir V. Borodin and Innovation and International Relations Office Director Alexander I. Cherednichenko, and were briefed on the FEB RAS's research mission, which includes the development of marine sciences in the Russian Far East as well as the fields of life science, biochemistry, medical physics, nanotechnology, mechanics and automation, and humanities and social sciences.

The NTU delegation was interested in the FEB RAS biotechnology center's extraction of materials from marine organisms for researching and creating active pharmaceuticals to fight cancer, protect the liver, regulate the immune system and work as antioxidants. NTU sees potential for research cooperation between the FEB RAS and NTU researchers in medicine, pharmacology, biotechnology and marine biology.



The Medical Complex of the Far Eastern Branch of the Russian Academy of Sciences

President Lee's delegation also visited the FEB RAS Medical Complex, where it held discussions with Chief Physician Sergey Kryzhanovskiy, Director Alexander Rybchenko of the Ecological Neurocybernetic Laboratory, Arctic Research Center, and Laboratory Director Larisa Bogdanovich. The Russian scientists reported on the Ecological Neurocybernetic Laboratory's medical physics research achievements and applications. The lab's magnetoencephalography equipment is of the type once used for medical projects under the Russian space program, able to detect latent diseases and provide treatment. The lab uses this equipment for the early detection of disease and evaluation of overall health condition, and has utilized it in the clinical treatment of ocular diseases.

The NTU team recognized similarities between some of the lab's research work and the Chinese medical theory of acupuncture energy channels, and sees potential for cooperation between the two institutions which might lead to breakthrough developments. The NTU officials, who were each tested with the FEB RAS equipment, expressed interest in bringing such instruments to Taiwan and cooperating in research on clinical applications.

(Left) President Lee's delegation is briefed on innovative pharmaceuticals at an FEB RAS technology exhibition hall; (center) The NTU delegation poses for a photo with members of the FEB RAS; (right) An FEB RAS researcher presents research results.



Law School Alumnus Donates NT\$10 million to Center for Public Policy and Law

Distinguished alumnus Attorney Jerry P. Yu donated NT\$10 million to fund research at the Center for Public Policy and Law. On December 6, 2011, a donation ceremony was held at which President Si-chen Lee accepted the gift on behalf of the university.

Mr. Yu was born into a prominent legal family. His father, Mr. H.F. Yu, founded The Law Monthly, which advocated the rule of law and promoted democracy in Taiwan. Mr. Yu has sought out opportunities to make positive contributions to society, particularly through his devotion to the advancement of public policy and legal education. He believes public policy must be implemented through the legislative system, and made this donation in hopes that the center will embrace inclusiveness and achieve balance among competing interests.

President Lee expressed profound gratitude to Mr. Yu for his ardent support, and called on the center to focus on national development and public policy issues that promote the public welfare.



NEW RESEARCH ETHICS OFFICE PROTECTS RESEARCH PARTICIPANTS



In 2009, the Eighth National Science and Technology Conference called on universities in Taiwan to establish research ethics committees. The National Science Council then selected one university in northern, central and southern Taiwan, respectively, to implement the "Human Behavior Research Ethics and Human Body Research Ethics Management System Establishment Plan" to set up and implement research ethics review mechanisms in order to protect the rights of research participants. As the designated university for northern Taiwan, NTU received an NSC subsidy to implement this plan and set up the Northern Alliance for the Protection of Research Participants in order to build consensus on protecting the rights of research participants.

NTU began implementing the NSC plan here on campus in January 2010. In the process of setting up a campus-wide research ethics system and promoting the concept of research ethics on campus, the university better appreciated the need to protect the rights of research participants. While it is necessary to engage in research, it is also the responsibility of an elite internationally-recognized university to respect and protect the research participants. Such protection supports the research conducted at a university by underwriting the trust of participants and thus increasing their willingness to take part in experiments.

After approving the relevant regulations in May 2011, NTU established the Research Ethics Office under the Office of Research and Development in August of the same year. The new office, in turn, established the university's Behavioral and Social Sciences Research Ethics Review Committee in November 2011.

At present, NTU's Research Ethics Office is coordinating the efforts of the Northern Alliance for the Protection of Research Participants Administration Center. In addition, to facilitate the review and evaluation of research plans, the office set up a website to share information on establishing review platforms, educational training, review mechanisms and regulations. These efforts will contribute to building consensus and effective communication mechanisms among the alliance members and promote the sharing of ideas in order to produce a sustainable cooperation model based on a diversity of input.

On December 27, 2011, NTU hosted a formal opening ceremony for the Research Ethics Office and the Northern Alliance for the Protection of Research Participants Administration Center. The office's sign was officially unveiled by President Si-chen Lee, Vice President Ching-hua Lo, Vice President Tzong-ho Bau, Dean of Student Affairs Joyce Yen Feng, Dean of Research and Development Ji-wang Chern and Director Hong-nerng Ho of the Research Ethics Office. Also in attendance were all of NTU's top-level administrators and the deans of every college, as well as representatives from each of the 27 other alliance member universities, the National Science Council's Human Research Participant Protection Office, the Central Alliance coordinator National Cheng Kung University and the Southern Alliance coordinator Taiwan's China Medical University.

NTU Cosmologist Celebrates Double Centennials at South Pole



An NTU research team is participating in the international Askaryan Radio Array project, which is building an immense radio antenna array designed to detect neutrinos at the South Pole.

In December 2011, Prof. Pisin Chen, director of the Leung Center for Cosmology and Particle Astrophysics, journeyed to the South Pole as a member of an international team to set up an immense radio antenna array designed to detect neutrinos. While there, Prof. Chen had the opportunity to join in celebration of two important centennials. Not only was 2012 the centennial of the founding of the ROC, it marked the one-hundredth anniversary of humanity's first setting foot on the geographic South Pole.

Named the Askaryan Radio Array, the network will comprise 37 antenna stations arranged along a hexagonal grid covering an area of approximately 100 square kilometers at the geographic South Pole. Each station will be placed 200 meters beneath the surface of the polar ice to measure the enhanced radio-frequency radiation emitted by neutrinos as they pass through the deep radio-transparent ice sheet.

Prof. Chen joined the team to take part in the installation of the ARA's first antenna station. This was no easy task. The team had to battle temperatures as low as minus 40 degrees Celsius and endure the low-oxygen atmosphere at 2,800 meters above sea level. The installation of the array's first antenna station was scheduled to be completed prior to the end of the Antarctic summer.

The team, which includes scientists from universities in the United States, Europe and Japan, expects to spend a total of US\$10 million to complete the ARA system over the next four years. Taiwan is providing ten of the stations, making its contribution to the array second only to that of the United States. Once completed, the ARA is expected to be in operation for at least five to ten years. If any major discoveries are made, the array could be expanded to an area of 1,000 square kilometers.

While at the South Pole, Prof. Chen proudly unfurled the national flag of Taiwan alongside the flags of the other nations represented at the South Pole. It turns out he had been so focused on preparing scientific equipment prior to his journey that he neglected to pack Taiwan's flag. Still, Prof. Chen, who is also a respected artist, singer and playwright, made his own flag of Taiwan to mark the historic occasion.



Cosmologist Pisin Chen shows off his ROC flag after returning from the South Pole.

On December 12, he held a video conference with the Taiwan's media to share his experience with the people back home in Taiwan. Upon returning to Taiwan, Chen donated his flag to the Gallery of NTU History.

Also, on December 14, Prof. Chen attended a ceremony marking the one-hundredth anniversary of Norwegian explorer Roald Amundsen's historic arrival at the South Pole. At Prof. Chen's invitation, Norwegian Prime Minister Yens Stoltenberg, who traveled to the South Pole for the event, recorded a video message wishing the people of Taiwan a happy ROC centennial.



NTU Hospital Signs Agreement with World's Leading Drug Development Firm

NTU Hospital signed a strategic agreement with the US-based pharmaceutical services provider Quintiles Transnational for the development of new drugs under the firm's Prime Site Program on December 14, 2011. NTU Hospital Superintendent Ming-fong Chen and Mr. Michael Klein, vice president of clinical development for Quintiles Asia Site Services, signed the agreement on behalf of the two parties. New drug development has long been a priority for the biotechnology industry in Taiwan, and cooperating with world class drug development partners is a foresighted approach to achieving this goal.

NTU Hospital Superintendent Ming-fong Chen and Mr. Michael Klein, vice president of clinical development for Quintiles Asia Site Services, sign their strategic agreement.



Representatives of NTU Hospital and Quintiles Transnational celebrate the signing of a cooperation agreement for the development of new drugs.

Quintiles Transnational is the world's largest contract research organization (CRO). It provides professional clinical trial services, consulting on new drug development and regulatory strategies, planning for the marketing of new drugs, research training, as well as assistance on complying with international legal and ethical standards. In 2011, the consulting and research firm Frost and Sullivan named Quintiles the year's best CRO in the Asia-Pacific region. This marks the fourth time in six years the company has earned this honor.

Through its Prime Site Program, Quintiles establishes partnerships with outstanding medical centers around the world to carry out innovative and groundbreaking research on new pharmaceuticals. The program aims

to accelerate the drug development process so as to meet patients' urgent need for better treatments.

NTU Hospital and Quintiles intend to cooperate on clinical research for new medicines in cardiovascular diseases, tumors, neurology and immunology.

NTU Hospital is the first hospital in Taiwan to participate in the Prime Site Program. The hospital operates an outstanding national-level clinical trials center that is a leading center for new drug development in Taiwan. The center employs some of the best medical professionals in Asia and has an excellent research environment. Its achievements in the development of new medicines place it among the best in Asia.

NTU and University of Tehran Sign Academic Exchange Agreement

At the invitation of the Taiwan-Iran Economic and Trade Association, a high-level delegation from the University of Tehran, Iran's oldest and most elite university, visited Taiwan, December 25 - 28. On December 26, the delegation met with President Si-chen Lee and NTU students and faculty members and signed a memorandum of understanding on academic exchanges. The agreement covers cooperation on academic research and publishing, the exchange of information, visiting faculty and



student exchanges, and the joint organization of academic conferences.

The University of Tehran delegation was headed by Chancellor Dr. Farhad Rahbar, who is an economist and former vice president of Iran. Chancellor Rahbar was accompanied by two vice chancellors and a



number of faculty members, as well as representatives of the Taiwan-Iran Economic and Trade Association. The delegation also met with other top NTU officials, including Vice President Tzong-ho Bau and Dean of International Affairs Hsiao-wei Yuan.

DEAN AND DOCTORAL STUDENTS WIN 21ST WANG MING-NING AWARDS

A dean and four doctoral candidates were recognized for their outstanding work in developing new pharmaceuticals at the 21st Wang Ming-Ning Awards on December 16. The Wang Ming-ning



Dean for Research and Development Ji-wang Chern (second from left) poses for a group photo after receiving his award.

Memorial Foundation established the annual awards in honor of China Chemical and Pharmaceutical Co. founder Wang Ming-Ning's lifelong commitment to improving Taiwan's pharmaceutical industry through the promotion of academic research.

The foundation presented Dean for Research and Development Ji-wang Chern with an Outstanding Contribution Award and NT\$1.5 million. In recent years, Prof. Chern pursued research using a variety of biomarkers to develop new drugs, and made breakthroughs in the search for drug treatments for degenerative neurological diseases. In particular, Chern has developed a drug treatment that fights dementia by inhibiting the shrinkage of neural axons.

The search for new pharmaceuticals and the development of drug technology are closely related to public health. Prof. Chern uses his specialization in pharmaceutical chemistry to conduct research in search of new drugs. He received his award for making outstanding contributions not only to the development of pharmaceutical technology but also to the promotion of public health and the wellbeing of society.

Four doctoral candidates received Outstanding Doctoral Thesis Awards and NT\$200,000 each. The thesis of Yu-chen Liu of the Institute of Biochemical Sciences is titled "Interception of teicoplanin oxidation intermediates yields new antimicrobial scaffolds." Meei-shyuan Lee of the Graduate Institute of Epidemiology and Preventive Medicine conducted a long-term follow-up study to investigate the relationship between hepatitis C virus serum biomarkers and the risk of developing liver cancer. Kuo-tai Hua of the Graduate Institute of Toxicology presented the thesis titled "N- α -acetyltransferase 10 Protein Suppresses Cancer Cell Metastasis by Binding PIX Proteins and Inhibiting cdc42/Rac1 Activity." Bing-ching Ho of the Institute of Clinical Laboratory Sciences and Medical Biotechnology conducted research analyzing his finding that microRNA-141 is upregulated upon enterovirus infection and could facilitate viral propagation.

NTU Shines Bright at Leading Telecommunications and Networking Conference



(Left) Prof. Wanjiun Liao; (right) Graduate student Sheng-chieh Wang (center) and Prof. Wanjiun Liao (right) accept their IEEE GLOBECOM Best Paper Award.

Students and professors of the Graduate Institute of Communication Engineering demonstrated once again their world class research prowess in telecommunications and networking at the 2011 IEEE GLOBECOM Conference. NTU won a best paper award and had a total of 22 papers accepted for presentation at the conference, which was held in Houston, Texas, December 5-9, 2011. Considered the Olympics of telecommunications research, the conference is the most important annual research-oriented event in telecommunications and networking.

Research teams led by Prof. Zsehong Tsai, Prof. See-may Phoong,

Prof. Wanjiun Liao, Prof. Hung-yun Hsieh and Prof. Kwang-cheng Chen of the Graduate Institute of Communication Engineering and professors of the Graduate Institute of Computer Science and Information Engineering presented 22 papers at the conference, accounting for nearly 50% of the papers from Taiwan at the conference. This shows again that NTU is the leader in the field of communications in Taiwan and that its innovation and research prowess continues to advance. Internationally, NTU ranked fifth in the world for the number of papers presented at the conference. NTU was led by Prof. Kwang-cheng Chen's Wireless Broadband Communication System Laboratory, which produced

ten of the papers NTU presented at the conference.

Graduate student Sheng-chieh Wang and Prof. Wanjiun Liao won an IEEE GLOBECOM Best Paper Award for their paper, "Cooperative Multicasting for Scalable Video in Wireless Networks." Addressing next-generation wireless networking environments, their research provides a solution for scalable video based on the currently hot research topic of cooperative multicasting. They present an innovative technology called CodedCM. This technology uses multi-resolution modulation and integrates cooperative multimedia multicasting to solve a variety of problems

Pair Wins Science and Technology Award for Promoting Taiwan-France Cooperation



Prof. Tony Wen-hann Sheu of the Department of Engineering Science and Ocean Engineering and Prof. Marc Thiriet of the Pierre and Marie Curie University are the winners of the 2011 Taiwan-France Science and Technology Award, which is awarded jointly by the National Science Council and the French Academy of Sciences.

The award recognizes the pair's outstanding academic work in developing mathematics and computer science applications over the last 12 years, as well as their promotion of international student exchanges, opening of joint courses and organization of conferences for academics in Taiwan and France.

Some of the topics Prof. Sheu and Prof. Thiriet have collaborated on over the years include dynamic behavior within the cardiovascular system and respiratory tract as well as the high-intensity focused ultrasound ablation of liver tumors. Next up, the pair will build mathematical models and associated multi-scale simulations of fluid-structure interactions for acupuncture in hopes of clarifying the physiological and scientific concepts at the core of acupuncture theory.

Event Introduces International Students to Their Chinese New Year Host Families



International students and their host families play a round of charades.

Each year, the Office of International Affairs makes arrangements for interested international students to spend the Lunar New Year with local host families, so they can learn about this most important of all holidays in Taiwan and experience the warmth and hospitality of local Taiwanese people. Before sending the students off to stay with their host families, the OIA holds a Lunar New Year Host Family First Meet and Greet to give the students and families a chance to get to know each other in a relaxing atmosphere. This year, about 40 students and host family members gathered for this event at the Global Lounge on January 15.

When the Meet and Greet kicked off at 3:00 p.m., the room was already abuzz with activity as the students and families had already jumped in by making introductions and engaging in small talk on their own. Dean of International Affairs Hsiao-wei Yuan opened the event with a welcoming statement to express her appreciation to the participating families and wish that the students and families all have a joyful Lunar New Year together. OIA personnel then acquainted everyone with details about the event and shared some intercultural communication techniques to make sure that everyone's Lunar New Year would go smoothly.

Next up was the interactive portion of the day's event. This commenced with a game of charades, which allowed the participants to communicate

Dean of International Affairs Hsiao-wei Yuan addresses the participants in the Lunar New Year Host Family First Meet and Greet.

with gestures and develop friendships through teamwork. The students and family members were divided into five teams, each of which was given seven minutes to give as many answers as possible. Before the competition began, the teams had ten minutes to make self introductions and choose their actors and guessers. The scene of the students and families struggling to communicate and guess the correct answers was as much fun to watch as it was to participate in.

Following the excitement of charades, the president of the NTU Cooking Club introduced the history of the *runbing*, a Chinese-style burrito, and taught its preparation method. As food is one of the pillars of the Lunar New Year, everyone joined together to wrap runbing and taste the result.

After the Meet and Greet, many students and families remained to discuss their Lunar New Year plans. Before the host families departed, the OIA presented each with a gift of fine rice as a token of gratitude for their participation.

The Meet and Greet was a pleasant way for the students and host families to get to know each other and learn about their respective cultures, and the smiles on everyone's face demonstrated the event was a resounding success. The OIA looks forward to more and more students and families participating in this host family program in coming years.

Food brings the international students and their host families closer together.



New Center for International Education Working to Attract International Students



▲ The Center for International Education holds a meeting introducing NTU's Summer + Programs.

In October 2011, the Office of International Affairs established the Center for International Education. With international student enrollment at NTU growing steadily, the new center is coordinating campus resources to create courses that meet the real needs of international students, such as specialized and general education courses taught in English. CIE aims to attract outstanding international students to make NTU a more competitive and internationalized university.

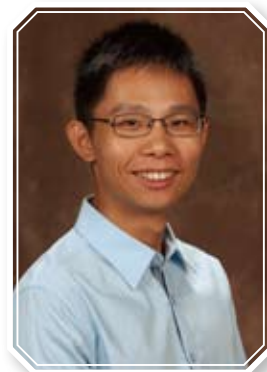
CIE is working with the Language Center of the College of Liberal Arts to plan both credit-granting and non-credit Mandarin language courses. It is also devising incentives to encourage professors to offer English language general education courses in the humanities, social sciences and natural and physical sciences.

The center has arranged four Summer + Programs for international students to be offered this summer: the Summer Intensive Program for Chinese and Culture; Summer Program for Laboratory Research; Biodiversity, Agriculture and Culture of Taiwan; and Summer Program for Biotechnology Training.

In November and December, 2011, the dean of international affairs and director of the Center for International Education went to the United States to promote the array of educational opportunities offered by NTU, including the Summer + Programs for international students. Their itinerary included the University of Washington, Rutgers University, Temple University, University of California, California State University and University of Southern California, three Mandarin training centers in the US West, as well as the Taipei Economic and Cultural Offices in New York, Los Angeles and Seattle. The pair also held six introductory meetings for overseas Chinese students during their trip.

NTU Graduate Named to Prestigious Washington University Academy

The information in this article was provided by the McDonnell International Scholars Academy.



NTU graduate Jerry Chih-chung Lin has been named a McDonnell International Scholar at Washington University in St. Louis. The McDonnell International Scholars Academy provides opportunities for talented international graduate and professional students to join the Washington University community. NTU is one of 27 premier universities from around the world partnered with the prestigious academy.

Lin, who earned a bachelor's of science degree from NTU in 2009, is pursuing a doctorate in immunology in Washington University's Division of Biology and Biomedical Sciences. He is the third Academy Scholar from NTU.

Lin made the NTU dean's list in the College of Life Science, and was named an Outstanding College Youth in 2008. Passionate about environmental protection, Lin is the founding president of Jane Goodall's Roots and Shoots group at NTU.

McDonnell Academy Scholars are expected to be future global leaders. As such, they are provided not only with a rigorous graduate education, but also with cultural and social activities designed to prepare them as leaders knowledgeable about the United States, other countries and vital international issues.

Each Academy Scholar is matched with a distinguished member of the Washington University faculty who serves as a mentor and also as an Academy Ambassador to the university partner from which the scholar has graduated.

Dr. David Ho is Lin's faculty mentor-ambassador. Dr. Ho earned a bachelor's degree in botany at NTU and is a professor of biology in the Division of Biology and Biomedical Sciences at Washington University.



A STUDENT'S EXPERIENCES AS AN EXCHANGE STUDENT IN OKINAWA

The following is excerpted from an article by undergraduate Delia Hou (Class of 2013) on her experiences as an exchange student at Ryukyu University in Okinawa.

"Irashaimase!" I stepped off of the plane and entered a country where suddenly I was the foreigner. Soon, I felt nervous and apprehensive as the program began and the impressive professors, researchers, assistants and students from various countries introduced themselves.

In the company of these confident professionals, I felt so insignificant. But, this feeling was turned upside down in just a matter of days. Guided by the host Ryukyu University professors and assistants, I had the opportunity to explore

the ocean, mangroves, rivers and mountains of Iriomote, as well as to learn technical skills, survey methods and data analysis.

I will never forget my new experiences during this exchange program. Not only did I bond with everyone in the program, student and professor alike; they arranged a memorable occasion to celebrate my 20th birthday. Definitely, it was a birthday I will never forget.

I had never been to such a beautiful place. The carefully preserved biodiversity of animals and habitats there was truly amazing. During a single ten minute walk to a convenience store near the research station, I saw flying foxes, song birds, owls, frogs, toads, crabs,



spiders, salamanders, geckos and many species of insects.

Indeed, I loved not only the program but especially the great people I met there. I am so honored to have had the chance to join the exchange program at Ryukyu University.

COURSE PRESENTED BY UC DAVIS BIOLOGIST VIEWABLE ON OPENCOURSEWARE WEBSITE



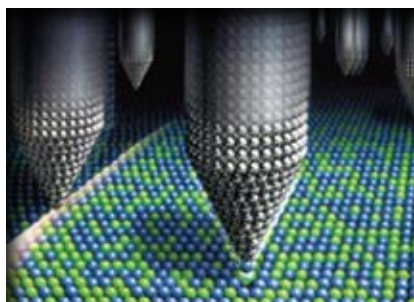
Dr. Larry Vanderhoef, chancellor emeritus of the University of California, Davis

Among the fascinating courses available on the NTU OpenCourseWare website is a nine-class course offered by Dr. Larry Vanderhoef, chancellor emeritus of the University of California, Davis: "Biology for Future Presidents: Important Concepts That Can Be Easily Understood."

Offered by the NTU Department of Life Science during three weeks during the fall term of 2010, the course was aimed to encourage students to reflect on such questions as: What is the position of my research in society? How do people in other fields regard this type of research? How might a certain research result impact society?

The following topics were covered during the nine class sessions: 1) Introduction to the course, scientific research; 2) The Earth's place in the universe, man's place in the tree of life; 3) Evolution, artificial selection; 4) Darwin's search for natural selection; 5) Genes--What are they? Where are they?; 6) Cancer (uncontrolled cell division) and HIV/AIDS--the deadliest cancer; 7) Impaired fluid flow in humans; 8) Organic farming and foods, genetic engineering; and 9) Stem cells--simple biology, moral dilemma.

Dr. Vanderhoef designed the course especially for non-specialists, and used humor to create a relaxing atmosphere. Instead of a textbook, Dr. Vanderhoef relied on articles selected from journals, books and newspapers. Do check out the course at <http://ocw.aca.ntu.edu.tw/ntu-ocw/index.php/ocw/cou/100S116/1>.



NTU scientists have used nanotechnology to more rapidly detect bacteria in blood.

The findings of an inter-institutional research team led by Yuh-lin Wang, a professor in the Physics Department and distinguished research fellow of the Institute of Atomic and Molecular Sciences, Academic Sinica, were published in the article, "Functionalized arrays of Raman-enhancing nanoparticles for capture and culture-free analysis of bacteria in human blood," in *Nature Communications* (Nov. 15, 2011).

The article reports on a novel biochip that captures and analyzes bacteria in a body fluid, such as blood, to facilitate the rapid diagnosis of infection. Able to identify bacteria in as little as 30

RESEARCHERS DEVELOP NANOTECHNOLOGY BIOCHIP TO IDENTIFY BACTERIA IN BLOOD



The researchers conduct a press conference explaining their nanotechnology research achievement.

minutes, this non-invasive technology has the potential to replace time-consuming bacteria culture processes, which take at least two to five days.

The dual-function biochip uses surface-enhanced Raman spectroscopy (SERS) to read the vibrational spectrum of the molecules on the cell wall of a single bacterium. Such a spectrum acts like a fingerprint of the molecules, which allows identification of the

bacteria. The team's innovation is to coat an array of silver nanoparticles with the antibiotic vancomycin. The nanoarray is a SERS-active substrate that magnifies the Raman signal of molecules, while the vancomycin serves to concentrate bacteria on its surface and exclude blood cells. The researcher team found that the antibiotic not only concentrates bacteria but also boosts the sensitivity of the sensor.

The team notes that this rapid, highly-sensitive nanotechnology sensing platform shows potential to be developed into a practical tool for the identification of microorganisms, such as bacteria and viruses, in a broad range of clinical samples. It could have applications in the detection of environmental pollution, food contamination and cancer.

TAIWAN JOINS THE INTERNATIONAL ASSOCIATION FOR FOOD PROTECTION

In 2011, the Taiwan Association for Food Protection became the newest affiliate of the International Association for Food Protection. Prof. Lee-yan Sheen of the Institute of Food Science and Technology at NTU serves as the first TAFP president. This organization will provide both positive assistance in safeguarding Taiwan's food supply as well as the latest global food safety information to local food safety officials and experts.

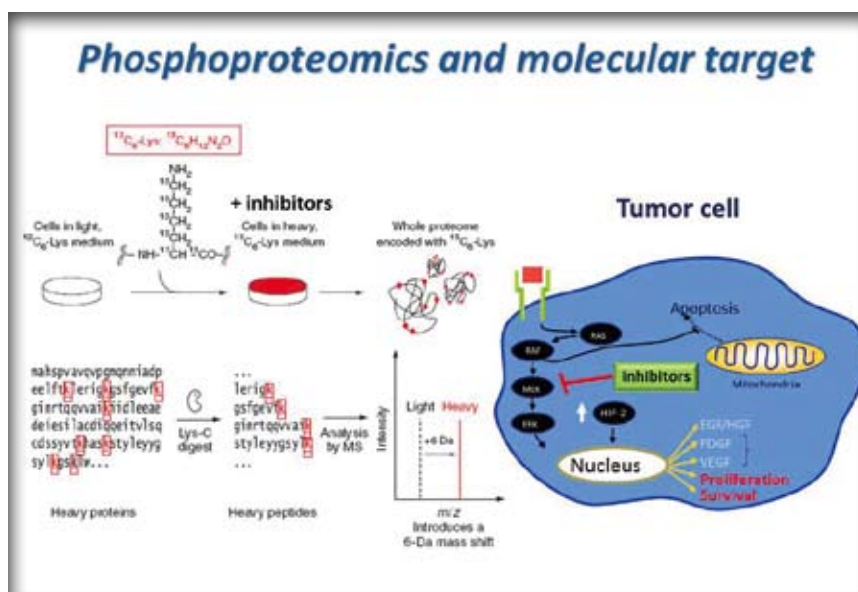
Prof. Sheen and Prof. Cheng-chun Chou, also of the Institute of Food Science and Technology, worked with Prof. Chia-yang Chen of NTU's Department of Public Health and other food safety scholars and a local government official, to enlist the support of friends in the United States to qualify Taiwan as an IAFP affiliate.

IAFP's mission is to facilitate the exchange of information for protecting the world's food supply. Established in 1911, the IAFP—like the ROC—celebrated its first centennial last year. IAFP has affiliates in more than 50 countries and a membership of 3,600 food safety professionals.

In May and June of 2011, the nation was shocked when authorities announced the discovery that the plasticizer DEHP was being added to a wide range of foods and beverages. It turned out that some producers of food clouding agents were using the plasticizer as a cheap substitute for palm oil. Even after the contaminated products had been removed from market shelves and the use of DEHP had been prohibited, consumers still suspect that the food supply is not healthy or safe. Thus, TAFP will play an important role in ensuring this type of food scandal does not recur.



PROTEOMICS LAB APPLYING ADVANCED TECHNOLOGIES FOR CLINICAL RESEARCH



The Proteomics and Protein Function Core Laboratory combines top-down and bottom-up proteomics approaches with state-of-the-art tandem mass spectrometry to obtain qualitative and quantitative protein profiles from clinical samples. The lab aims to develop new approaches for early diagnosis, prognosis, patient biomarker selection, therapeutic interpretation and target identification for diseases.

In the post-genomics era, proteomics is an important tool in biological and biomedical studies. The proteome is of intense interest to investigators because proteins are the major functional components of cells. Proteomics is the systematic study of the unique proteins, metabolites and interactive fingerprints of biological systems.

The mission of the Proteome Lab is to provide technological support for biomedical research and to translate basic research discoveries into clinical applications that

improve the treatment of disease. The lab researchers and technicians conduct studies in differential proteomics, glycoproteomics, chemical proteomics, protein interactome and quantitative proteomics.

In one study, the lab adopted a cancer immunomics approach that combined mass spectrometry and serological proteome analysis techniques to identify novel biomarkers. Total proteins extracted from cancer cell lines were separated by two-dimensional gel electrophoresis and subsequently incubated with sera from cancer patients or normal parts. Comparison of autoantibody responses generated by cancer and normal subjects allowed the researchers to identify the differentially expressed tumor-associated antigens.

The aim of another study was to set up a platform to screen for serum glycoproteins as metastasis biomarkers of lung cancer. Concanavalin A affinity

chromatography was used to enrich N-linked glycoproteins from lung cancer patients. The differentially expressed cancer-related glycoproteins were validated and evaluated by Western blotting or Aleuria aurantia lectin staining.

Chemical proteomics is emerging as a novel approach to study the relationship between small molecules and their protein partners in the cell. Chemical proteomics provides a whole proteome-wide, high throughput platform for small molecule targets discovery. The lab adopted this increasingly used approach based on affinity purification techniques with immobilized small molecules to identify cellular targets of potential drugs.

The role of protein interaction in tumor progression remains somewhat enigmatic and controversial. Aiming to understand the protein network by its biological functions, the lab has performed a comprehensive analysis of the interactome of tag-fused target proteins in cancer cells using co-immunoprecipitation and tandem MS to identify potential phosphorylation sites and functional roles.

The lab also applies such quantitative and phosphoproteomic approaches as SILAC (stable isotope labeling with amino acids in cell culture) and iTRAQ (isobaric tag for relative and absolute quantitation), which have become powerful strategies to globally investigate cellular phosphorylated proteins and their signaling pathways.

NTU LAB WORKING TO PROMOTE STEM CELL RESEARCH IN TAIWAN



 The Stem Cell Lab's Laser-Enabled Analysis and Processing (LEAP) system

The Center of Genomic Medicine's Stem Cell Core Lab works to supply materials for stem cell researchers nationwide. Its mission includes providing human embryonic stem cells (hES cells), disseminating techniques for the characterization of hES cells, integrating the services provided by the Center of Genomic

Medicine's core laboratories and promoting international collaboration.

The lab has derived three hES cell lines, called NTU1, NTU2 and NTU3. Besides these NTU cell lines, the lab provides the commonly used hES cell H9 and mouse embryonic fibroblasts feeder cells. Recently, the lab's ES cells were used in several interesting research projects on HLA typing of stem cells for transplantation, hematopoietic stem cell differentiation and drug screening.

Some recent research suggests that the presence of "cancer stem cells" is the primary reason cancer is difficult to cure completely. Two theories have been proposed to explain this fact. One maintains that each tumor cell has the ability

to form another tumor, but that this potential might be controlled. The other suggests that not all cells in the tumor have the same functions and that only a few cells possess the ability of self-renewal to maintain the growth of the tumor.

Recent studies have discovered that cancer stem cells might be identified by specific surface markers. At present, cancer stem cell research is focused either on designing target medicines according to the characteristics of cancer stem cells or on methods of killing the cancer by spurring its differentiation so as to deprive it of its ability to self-renew.

NTU MEDICAL SCIENTISTS FIND ANTI-AGING REMEDY IN YEAST

In a report published in *Cell* on September 16, 2011, medical scientists at NTU and researchers at the Johns Hopkins Medical Institute described their identification of a novel pathway regulating an age-related protein modification in baker's yeast. The researchers found that levels of protein modification declined along with aging, and further successfully demonstrated manipulation of yeast life span by removing and restoring this modification.

"We envision that the discovery is not limited to yeast, since the major components involved in the pathway are conserved from yeast to humans," says Dr. Lee-ming

Chuang, a distinguished professor of internal medicine at NTU.

This protein modification is acetylation, i.e., the addition of acetyl groups to the lysine side chain of an existing protein. This was the first time that protein acetylation was shown to be implicated in the aging pathway. Even more intriguing, the scientists showed that this type of longevity regulation is independent of diet and calorie restriction, hence it represents a whole new potential therapeutic target for aging and aging-related diseases.


In particular, the team showed that acetylation of the protein Sip2 influenced yeast longevity, the

number of daughter cells a yeast mother cell can produce throughout her lifetime, i.e., her

replicative life span. The replicative life span in normal

yeast cells is around 25. In the yeast cells genetically modified by the scientists to mimic the removal of Sip2 acetylation, the replicative life span is shortened to 18. However, when they were modified to mimic the restoration of Sip2 acetylation, the life span was extended to 38.



 Levels of Sip2 acetylation (Sip2Ac) decrease with aging. Restoring Sip2Ac promotes rejuvenation and prolongs life span.

Major Renovation Revitalizes Scenic Drunken Moon Lake

A four-month project to renovate Drunken Moon Lake, one of the campus' most beloved scenic spots, was completed at the end of December 2011. This makeover involved replacing the old, dilapidated facilities surrounding the lake and purifying its murky water. Now, the lake is an alluring natural place for people, pets and wildlife alike.

Prior to the makeover, the old stone walkway encircling the lake had fallen into disrepair as a result of tree roots growing beneath it. Now a smooth walkway circles the lake that is perfect for leisurely strolls.

Also gone is the old cement railing along the lake's edge. Stone steps now go down to the water's edge to allow visitors to get down next to the water's edge. The project's foreman, Mr. Lan, says safety concerns were addressed by using cobblestones to give the lakebed a gradual shallow slope along the shore. Installed by an ecology friendly approach, the steps are not set cement but are secured by clay.

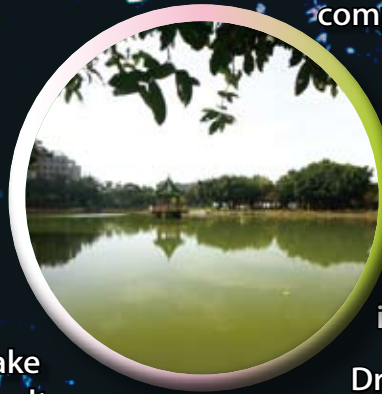
The renovators made many improvements but also preserved some of the lake's original charm. Most importantly Mid-lake Pavilion, which is the setting of a campus ghost story, remains standing. Prof. Yeun-min Tsai of the Department of Chemistry

says Drunken Moon Lake is a shared memory for all of the NTU family and the renovation project avoided destroying that memory by changing the lake's appearance completely.

With the project completed, the lake is coming to life once again. Vegetation planted along the lakeside is gradually filling out. This includes some nectar producing plants intended to attract butterflies.

Drunken Moon Lake is actually a series of three lakes, one large and two small, that are interlinked. A new water aeration and circulation system keeps the lake's water flowing and improves its oxygen saturation, ensuring the water remains clean. The system creates a small waterfall and the pleasant sound of splashing water.

The project has made the lake an even more welcoming habitat for both resident and itinerant animals. It is common to see turtles sunning themselves on a floating island constructed of bamboo and coconut fiber near Mid-lake Pavilion. Mr. Lan says a number of wild birds have been spotted on the island already and that they will perhaps chose it as a home for their nests. The lake regularly attracts wild ducks, which can be seen playing near the shore. There are plans to introduce carp to the lake as well.



NTU Library Offering Mobile Tutorials

NTU Library's E-Learning Center now offers mobile learning services. These services provide face-to-face instruction to students in real time wherever they might be via their computers. And, the tutorials are recorded online, so the students can easily review and others, including the general public, may access them, as well.

At present, two kinds of tutorials are offered: 1) library skills tutorials that provide training in the use of EndNote, and 2) foreign language and literature tutorials that introduce English literature appreciation and online resources for language learning.

The tutorials are offered in Mandarin on the E-Learning Center's website: <http://elearning.lib.ntu.edu.tw/>.



TiMeGo Student Team Wins Creative Business Plan Contest in China

On December 16, 2011, a team of students led by Roy Chang of the Creativity and Entrepreneurship Program won the Shenzhen-Hong Kong-Taiwan-Macau University

Student Creative Plan Championship at Shenzhen University.

The competition required teams to devise innovative business plans.



Chang's team, called TiMeGo, developed a virtual tour guide. The system allows travelers to sync photographs, videos and itineraries from their journeys with an online map. The travelers can then share their adventures with others, permitting them to enjoy a virtual travel experience and even make their own travel plans.

Team leader Chang, a student in Biochemical Science and Technology, was responsible for building a team of students that could realize his innovative idea. He appointed Shun-hsing Ou of the Department of Electrical Engineering chief of technology and made Qing-cheng Li of the Department of Computer Science and Information Engineering chief of knowledge. His chief of information was Chung-jun Cheng of the Graduate Institute of Electronics Engineering, and Yu-chien Lin of National Taipei University of Technology's Graduate Institute of Innovation and Design was named general manager of creativity.

Chang also recruited Ting-sheng Lin of National Tsing Hua University's Institute of Information Systems and Applications to be general manager of art and Yun-wen Luo of the Graduate Institute of Finance as chief of finance.

The competition actually began on April 30. At first, there were 114 teams from 38 universities; but only 13 teams survived to compete in the finals.

Team TiMeGo prepared long and hard to make sure its presentation would win over the judges. However, moments before the presentation, a problem with a computer cable prevented the team from showing a projection of the presentation. Chang seized the opportunity to mount the stage and present the team's application via a lively question-response method. Chang now half jokes that if it wasn't for that faulty cable they mightn't have won the completion.

Book and Exhibitions Celebrate NTU History on ROC Centennial



The Gallery of NTU History has published a book and arranged two special exhibitions to commemorate the university's history on the centennial of the founding of the ROC. They present old black and white photographs, yellowing documents and moving personal stories that recall NTU's glorious past.

The book, *Youth, Memories, and the NTU of the Past: The Stories of 20 Historic NTU Photos*, published by NTU Press, is a compilation of old photographs coupled with anecdotes related by professors and alumni that recall the youthful memories of earlier generations. Half of the photos feature buildings and locations, while the other half recall historical events.

The exhibition, "From Taihoku Imperial University to National Taiwan University: Collected Documents and Papers," running from October 7 to February 29, displays such precious artifacts as imperial orders, graduation diplomas and student identification cards from the Japanese period and the early years of the ROC in Taiwan.

The exhibition, "Life Maps of NTU Campus, Episode 1, Students in School," running from November 15 to February 29, is based the results of an online survey asking students to name their favorite locations on campus for studying, dating and extracurricular activities, and to share their personal stories about these places.

Joint Exhibition Highlights the Intrinsic Energy of Forms

Forms and Forces: Morpho-diversities," a joint exhibition organized by NTU Museums and the University Museum of the University of Tokyo, is currently being held in the atrium of NTU Library. The exhibition encourages the exploration of forms, both natural and manmade, and highlights their myriad varieties.

The displayed items were selected for their scientific and aesthetic qualities. The curators state, "Form is force. It is only by adopting a particular form that matter manifests its intrinsic energy." They hope to focus visitors' attention on "forms and their inherent force."

The exhibition runs until March 18. Further details are available at: <http://www.museums.ntu.edu.tw/morpho-diversities.jsp>.



Ph.D. Student Determined to Swim for National Team at London Olympics



Ph.D. student Joey Cho-yi Chen, who is determined to represent Taiwan in the pool at the London 2012 Olympic Games, appears in his two roles: serious student and determined swimmer.

Joey Chen, a Ph.D. student in the Genome and Systems Biology Degree Program, is not just a serious scientist but a record-breaking Taiwanese swimmer determined to be chosen for Taiwan's national team at the London 2012 Olympic Games. Chen, who set a record in Taiwan for the 200-meter breaststroke, represented Taiwan at the 2004 Olympics and the 2010 Asian Games.

Chen joined his school's swimming team in the third grade because he thought it was fun. Gradually, he became a dedicated swimmer who even passed up the opportunity to attend one of Taiwan's most prestigious high schools to continue his training at a school closer to home. During that time, he competed constantly in swim meets and worked with virtually every swimming coach in Taiwan.

Having trained six hours a day during high school, Chen admits he had a lot of catching up to do academically when he entered NTU as an undergraduate. Since then, he has divided his life into two parts--academics and swimming. Despite his sacrifices, Chen has no regrets. He says that as long as your goals are clear and you understand what is most important to you, everything will be all right. He is also fortunate to have the support and encouragement of his advisor Prof. Hsueh-fen Juan, who makes sure he finds time to hit the pool.

Chen manages to squeeze in only two hours of training per day these days. Still, his determination allowed him to win the gold medal in the 50-meter breaststroke at the 2011 National Games, and will be the key to his competing at the 2012 Olympics.

Leadership Students Learn by Doing Community Service

Students from the Leadership Development Program have branched out into the community to learn by doing community service. Seventeen students enrolled in the Team Learning and Outdoor Leadership Course, under the National Youth Commission's Youth Community Participation Action Plan, drew up community development plans for communities in Gongguan and Shenkeng.

The Mornings Only organize morning jogs on the NTU campus. Three Inches of Sunlight promotes appreciation of the history and culture of the Gongguan area around the NTU campus. The Eco Warriors promote the recycling of used cooking oil. For one activity, they left the NTU area to teach people in

Taipei's Shenkeng District, Taiwan's tofu capital, how to make handmade soap from the cooking oil used to fry the popular snack stinky tofu.



The three groups were named Outstanding Groups under the Youth Community Participation Action Plan. They participated in the Outstanding Groups Competition, which gave them the chance to share their experiences with the public and exchange ideas with other groups.

NTU at a Glance

NTU Press inaugurated its Literature and Culture of Taiwan Series with the publication of two new books last year.



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In *The Lyrical Tradition in Modern Times: Four Essays*, Dr. David Wang introduces Chinese and international takes on lyrical language from a modernist perspective. In the succeeding essays, he examines Taiwanese composer Jiang Wen-ye, Chinese literature scholar Tai Jing-nong (former head of the Department of Chinese Literature) and Chinese writer Hu Lancheng. These studies offer glimpses into the conceptual origins, forms of media, past and present approaches and political dimensions of the language of the lyrical tradition, as well as the relation of the lyrical tradition to Taiwan studies.



In *Gender, Politics and the Performance Culture of Beijing Opera*, Beijing opera scholar, playwright and diehard fan Dr. An-chi Wang analyzes the development and transformation of Beijing Opera during the last century. Specifically, she delves into Beijing opera's composition, direction, performance and stage design from the perspectives of gender and politics.

NTU Press's Literature and Culture of Taiwan Series is aimed to explore the diversity and openness of Taiwan cultural studies. The lyrical tradition of Chinese literature has made major impacts on Taiwan literature. Additionally, while the origins of Beijing Opera lie in the Northern Chinese performance art, this tradition has spread, made its mark and flourished here in Taiwan.



Global MBA Program Accepting Applications Through March 15

NTU's Global MBA Program is accepting local and international applications for the 2012/2013 academic year through March 15. The program is the gateway to a successful career and a great opportunity to expand the student's global network.

In keeping with other top-ranking MBA programs, this program requires no written entrance examination for admission. Anyone with over two years of full-time work experience and a bachelor's degree may apply. English is the language of instruction, and the program provides a rigorous, practical MBA curriculum taught by outstanding faculty members. In addition, the program offers international exchange opportunities at partner universities worldwide.

Students from over 40 countries attend the Global MBA Program, which has a 51 percent local and 49 percent international student body. The students average 30 years of age and come from such world-renowned institutions as Cambridge, Columbia, Cornell, NYU, Purdue, Duke and Berkeley with backgrounds in information technology, education, manufacturing, finance, communication, architecture and law.

A 2011 survey conducted by *Global Views Magazine* and IO4 Job Bank ranked NTU as the top recruitment choice for enterprises in Taiwan and the Greater China region. In 2010, the NTU College of Management gained accreditation by the Association to Advance Collegiate Schools of Business.

For more details regarding application requirements, please visit: www.mba.ntu.edu.tw.



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