



31 March 2011

**Science, Technology and Education News from Taiwan  
Number 03 — March 2011**

**Introduction**

**Science and Research Organizations in Taiwan (1<sup>st</sup> part)**

**(list to be continued in the April edition)**

<a href="#"><u>National Science Council</u></a>	The National Science Council (NSC) is responsible for the promotion of development in science and technology in Taiwan. There are eight departments and four offices within the NSC. In addition, there are four affiliated organizations and six national research laboratories under the NSC. <a href="http://stn.nsc.gov.tw/en/index.asp?ComeIn=Y">http://stn.nsc.gov.tw/en/index.asp?ComeIn=Y</a>
<a href="#"><u>Academia Sinica</u></a>	Academia Sinica was founded in 1928. As the highest academic institution in Taiwan, it has two basic missions: conducting scientific research in its own institutes, as well as providing guidance, channels of communication, and encouragement to raising academic standards in the country. <a href="http://www.sinica.edu.tw/main_e.shtml">http://www.sinica.edu.tw/main_e.shtml</a>
<a href="#"><u>National Museum of Marine Biology and Aquarium</u></a>	The National Museum of Marine Biology and Aquarium serves a very important role in national education and cultural construction. The main goals are to provide information, to support academic research, to organize entertaining exhibitions, to promote international cooperation, to promote the local people's knowledge and standard of living, to promote the conservation concept and skills of marine life. <a href="http://www.nmmba.gov.tw/english/home/dream/homed-1.html">http://www.nmmba.gov.tw/english/home/dream/homed-1.html</a>
<a href="#"><u>Central Geological Survey</u></a>	The Central Geological Survey (CGS), under the Ministry of Economic Affairs, is the only government agency responsible for geological survey and geoscience research. The fundamental work includes geologic survey, research, and compilation of geological map sheets that provide basic geological information. The Survey is also involved in investigations of environmental geology, hydrogeology, geological hazards, active faults, landslides, engineering geology, and mineral resources that are important to national economic and urban development and major construction projects. <a href="http://www.moeacgs.gov.tw/english2/index.jsp">http://www.moeacgs.gov.tw/english2/index.jsp</a>
<a href="#"><u>Institute of Transportation</u></a>	The Institute of Transportation (IOT) serves as the think tank of the Ministry of Transportation and Communications. The transportation service includes roadway transportation, marine transportation, and air transportation; among them, bus services, cargo services, and information services are especially closely related to the public's daily life. <a href="http://www.iot.gov.tw/english/mp.asp">http://www.iot.gov.tw/english/mp.asp</a>
<a href="#"><u>Center of Harbor and Marine Technology</u></a>	The major duties of the Institute of Harbor and Marine Technology (IHMT) include: research and development of harbor- and ocean-related engineering techniques; education and training of engineers in related professions; resolving practical problems associated with harbor or marine construction works and coastal zone developments; etc. <a href="http://www.ihmt.gov.tw/eng/index-e.asp">http://www.ihmt.gov.tw/eng/index-e.asp</a>
<a href="#"><u>Taipei Veterans General Hospital</u></a>	Since its founding in 1959, the Taipei Veterans General Hospital has been dedicated to three equally important functions: medical education, medical research, and medical services. Additionally, it provides technical supports to eleven veterans hospitals located throughout Taiwan. <a href="http://www.vghtpe.gov.tw/doce/">http://www.vghtpe.gov.tw/doce/</a>
<a href="#"><u>Institute of Nuclear Energy Research</u></a>	The Institute of Nuclear Energy Research (INER) was established 30 years ago. It is the only domestic and specialized nuclear energy R&D institution in Taiwan, under the supervision of the Atomic Energy Council. <a href="http://www.iner.gov.tw/html/00_English/index.htm">http://www.iner.gov.tw/html/00_English/index.htm</a>
<a href="#"><u>National Research Institute of Chinese Medicine</u></a>	The National Research Institute of Chinese Medicine includes four research sections, an information section, a herbal drug quality control center and a biological activities screening center. <a href="http://ejournal.nricm.edu.tw/en/">http://ejournal.nricm.edu.tw/en/</a>
<a href="#"><u>Industrial Technology Research Institute</u></a>	The Industrial Technology Research Institute of Taiwan is a national-level non-profit R&D organization which carries out projects entrusted by government and private companies. <a href="http://www.itri.org.tw/eng/">http://www.itri.org.tw/eng/</a>

Source: NSC National Science Council



## Contents

A student invented a pedal-powered LED lighting system for bicycles – design students invented a new way of scanning books without a scanner – six Taiwanese product designs received the iF gold awards – a research team developed a process to make key components of flexible e-books and displays from silk protein – ITRI and Wan fang Hospital developed the first domestically made leukemia target drug candidate – a research team identified the role of a motor protein in forming autophagosomes – the National Cheng Kung University and the National Space Organization signed a memorandum of understanding to further develop advanced satellite propulsion technology – scientist achieved a breakthrough in cell rejuvenation by injecting four genes into a mature cell – local scientists document the world's first knife-wound HIV infection – China Steel Corp. in Kaohsiung and the National Taiwan University of Science and Technology launch a joint steel research center – IBM launched a new power systems development laboratory – the National Chip Implementation Center released a new method of building IC chips that can cut the development time of chips by two-thirds and the cost by one-half – the Institute of Transportation developed a bridge safety warning system – a team of scientists reported that the hearing loss is an authentic symptom of Huntington's disease – researchers linked genetic screening with drug side effects – biotechnicians found that feeding fish powdered garlic can help them grow bigger and healthier.

1.	Student licenses pedal-power invention for NT\$2 million	3
2.	Students invent way of scanning books without a scanner	3
3.	Taiwan wins six iF gold awards for product design in Hannover	3
4.	Taiwan Research Team Breakthrough	3
5.	The First Domestic Leukemia New Drug in Taiwan Transferred by ITRI	3
6.	Biochemists at Academia Sinica Identify Link between a Motor Protein and Forming of Autophagosomes	4
7.	National Cheng Kung University inks satellite technology MOU	4
8.	Researchers in Taiwan report breakthrough in 'cell rejuvenation'	4
9.	Local scientists document world's first knife-wound HIV infection	5
10.	CSC, NTUSC launch joint steel research center	5
11.	IBM sets up Taiwan research center	5
12.	New 'stacked' chip saves research time, cost: CIC	5
13.	Agency develops bridge safety warning system	6
14.	Fingerprint-free Touch Panel Becomes Possible! National Taipei University of Technology Develops "Diamond Film"	6
15.	Taiwan Biomedical Researchers Show Hearing Impairment Is Authentic Symptom of Huntington's Disease	6
16.	Researchers in Taiwan link genetic screening with drug side effects	7
17.	Biotechnicians resort to age-old remedy to keep fish healthy	7



### 1. Student licenses pedal-power invention for NT\$2 million

(Central News Agency, 01 03 2011)

A senior undergraduate got her first "pot of gold" by licensing her patented invention, a pedal-powered LED lighting system for bicycles, to a local company for NT\$2 million. Whereas bicycle lights are usually installed separately and require regular battery changes, her invention has LED lights installed on the pedals that are powered by a pedal-propelled mini generator and equipped with a rechargeable battery.

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=218429&CtNode=9>

### 2. Students invent way of scanning books without a scanner

(Taipei Times, 02 03 2011)

What can you do if you need to scan the pages of a book in a library but have no access to a scanner? A pair of Taiwanese design students have come up with a novel solution — using the Web cam of a notebook computer. They created an extendable "camera stick" that can be pulled out from the top of the computer screen — similar to an aerial, but with a tiny camera mounted on it. The user can then turn the stick down 90 degrees so that the camera can be aimed at the book lying on the table next to the laptop. The focus and scope of the area to be photographed can be adjusted using additional controls at the edge of the screen. In addition to the camera design, the young designers also added a handle to the laptop to make it easier to carry. When the notebook is opened, the handle becomes a stand that props up the computer and angles the keyboard and screen toward the user, making it easier to type and allowing heat to be dissipated more efficiently.

<http://www.taipeitimes.com/News/taiwan/archives/2011/03/02/2003497173>

### 3. Taiwan wins six iF gold awards for product design in Hannover

(Central News Agency, 02 03 2011)

Four companies and a nonprofit organization from Taiwan received gold awards for product design at the prestigious International Forum Design Awards in Hannover. Qisda Corp., which was honored for its mini projector and LED display, and In Win Development Inc., which was recognized for its HDD silicon enclosure, were among the Taiwanese recipients of product design gold awards, given to the top 50 entries in the competition. Other corporate winners from Taiwan were Adata Technology Co. for its USB flash driver, and Shiang Ye Industrial Co. for its folding chair. The nonprofit winner was the Taiwan Textile Research Institute, which was recognized for its "fabric garden," a green building material described as the first ever 3D hyperbolic surface textile. The fabric's composite fibers provide a substitute for soil, enabling it to be used as the base for a garden on a balcony or roof.

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?ID=201103020009&Type=aECO](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?ID=201103020009&Type=aECO)

### 4. Taiwan Research Team Breakthrough

(ICRT news, 04 03 2011)

A research team at Taiwan's National Qing Hua University is claiming a major breakthrough in transistor technology. The school says the team has developed a process to make key components of flexible e-books and displays from silk proteins. The new technology took the team two years to develop. It turns liquid silk into thin membranes to serve as insulators for flexible organic thin-film transistors—a key material for electronic products that can bend and fold. The leader of the research team said the biggest merits of the new discovery are its low cost and high performance. He said silk materials are not only cheaper and easier to obtain and process than traditional materials, they also improve the speed and performance of the transistors. Performance-wise, the silk transistors are also many times speedier than their traditional counterparts. The technology will mostly be used to produce key components in flexible e-books and light emitting diode displays. It is estimated that it will take at least 2-3 years before electronic products using this technology are launched.

[http://www.icrt.com.tw/newsroom\\_news\\_detail.php?newsId=8214](http://www.icrt.com.tw/newsroom_news_detail.php?newsId=8214)



## 5. The First Domestic Leukemia New Drug in Taiwan Transferred by ITRI

(MEPO Forum, 04 03 2011)

BCC (2011/02/22) ITRI and Wan Fang Hospital together developed the first domestically made leukemia target drug candidate, which was transferred to local biomedical manufacturer on February 22 and was expected to enter the market soonest in five years. In the future, the AML (acute myeloid leukemia) patients will have one more drug option. The development of this anti-cancer drug candidate, ITRI-260, jointly by ITRI and Wan Fang Hospital was supported under the TDPs, DoIT, MoEA (Industrial) Technology Development Programs of the Department of Industrial Technology, Ministry of Economic Affairs). This was the first independently made and patent-owned anti-cancer drug in Taiwan, which makes Taiwan step out of the stage as mere generic drugs and API (active pharmaceutical ingredients) provider. The achievement was regarded as an important milestone of the biotechnological industry in Taiwan.

<http://web1.nsc.gov.tw/techwp.aspx?id=1000223003&ctunit=208&ctnode=287&mp=7>

## 6. Biochemists at Academia Sinica Identify Link between a Motor Protein and Forming of Autophagosomes

(MEPO Forum, 04 03 2011)

*Academia Sinica Newsletter* (2011/02/22) Dr. Guang-Chao CHEN and Hong-Wen TANG, an Assistant Research Fellow and a PhD student, respectively, at the Institute of Biological Chemistry at Academia Sinica, recently identified the role of a motor protein (myosin-II) in forming autophagosomes. Autophagy is a process by which components of the cytoplasm (the jelly-like substance that fills a cell) are engulfed and degraded; it has recently been found to play a key role in certain human diseases such as cancer, infection and immunity, cardiovascular disease, myopathy, and neurodegeneration. The results of the study may aid the development of therapeutic intervention for autophagy-related diseases. The research was published in the *EMBO Journal* on February 16, 2011, and was selected by *Nature Reviews Molecular Cell Biology* as a Research Highlight.

<http://web1.nsc.gov.tw/techwp.aspx?id=1000223001&ctunit=208&ctnode=287&mp=7>

## 7. National Cheng Kung University inks satellite technology MOU

(Taiwan Today, 08 03 2011)

National Cheng Kung University (NCKU) in Tainan City and the Hsinchu-based National Space Organization (NSPO) signed a memorandum of understanding to further develop advanced satellite propulsion technology on 7 March. NCKU, the first national university in Taiwan to establish a graduate institute in aeronautics and astronautics, has already developed some key technologies in the field over the last 30 years. The research project comes in two stages. During the first phase, which runs from January 2011 to December 2013, the emphasis will be on the making of propulsion components and their integration into a module system matching NSPO requirements. The second stage, set to take place from January 2014 to December 2017, will focus on the development of a module system capable of functioning in space-like conditions such as zero gravity and low temperatures. In addition, a satellite propulsion lab responsible for component and system testing and authentication, the first of its kind in Taiwan, will be established at NCKU. A total of NT\$100 million will be invested in the project, with NT\$55.3 million coming from NSPO.

<http://www.taiwantoday.tw/ct.asp?xItem=155114&ctNode=445>

## 8. Researchers in Taiwan report breakthrough in 'cell rejuvenation'

(Central News Agency, 10 03 2011)

Scientists at National Central University-Cathay General Hospital have achieved a breakthrough in cell rejuvenation by injecting four genes into a mature cell, which resets the cell's bio-clock to a state similar to fertilization. The research team has managed to induce fibroblast cells to split into pluripotent stem cells, which are similar to embryonic cells, said Professor Akon Higuchi of the university's Department of Chemical and Materials Engineering. The technique involves opening up the membrane of a mature cell so that it accepts four genes -- Oct4, Sox2, Klf4 and c-Myc -- which work like "a key to the source of life," explained Ling Qingdong, director of the Cathay Medical Research Institute. Once the mature cell's bio-clock has been reset by the genes, the cell becomes rejuvenated, reverting to the state of newly fertilized cell, Ling said. The beauty of this technique is that there is an infinite supply of cells and the four genes do not have to be carried by viruses in order to alter the mature cells, he said. "We are calling



it a breakthrough because there is no danger of contamination by viruses," Ling said. "Furthermore, we don't have to use embryonic cells and therefore will not invite ethics debates." However, Higuchi said his team has only been able to achieve a 0.3-1 % success rate. This means that only 3-10 of every 1,000 mature cells were successfully converted into multi-purpose stem cells, he said, adding that improvement would be needed. In spite of the low success rate, the authoritative Chemical Review published the research report in its current online issue, saying the technique had good prospects.

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aSOC&ID=201103100027](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aSOC&ID=201103100027)

## 9. Local scientists document world's first knife-wound HIV infection

(Liberty Times, 11 03 2011)

The Center for Disease Control (CDC) determined, via gene sequencing technology, including advanced molecular biology cross matching and HIV antibody concentration analysis, that a man contracted HIV from the hoodlum. The findings were submitted lately for publication in the AIDS Research and Human Retrovirus Journal by the CDC and research teams from National Yang Ming University and National Taiwan University. Researchers from the CDC confirmed that this was the first article that was published internationally showing that antibody concentration analysis and molecular biology tests could be used to confirm the path of AIDS infection. This also marked the first example documented in an international journal of a person contracting AIDS in such a fashion.

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=219363&CtNode=9>

## 10. CSC, NTUSC launch joint steel research center

(Taiwan Today, 11 03 2011)

Kaohsiung-based China Steel Corp. and National Taiwan University of Science and Technology (NTUSC) launched a joint research center promoting the use of steel in the local construction industry. The NTUSC collaboration is the Taiwanese steel giant's third national industry-academic alliance, following those with National Cheng Kung University on electric motors in 2008 and National Sun Yat-sen University on metal properties last year.

<http://www.taiwantoday.tw/ct.asp?xItem=155861&ctNode=445>

## 11. IBM sets up Taiwan research center

(Central News Agency, 24 03 2011)

US-based IBM launched a new Power Systems development laboratory in Taiwan, making it a hub for the company's research workforce and business in the Greater China area. The new lab, the company's only Power Systems research center outside the United States, is expected to add to the range of IBM expertise in Taiwan, including design capabilities in electrical, mechanical, thermal and firmware, as well as enhancement skills in spec identification, customer services, industry domain know-how and cross-region management, an IBM official said. "The talented, technical workforce in Taiwan, its healthy ecosystem of world-class universities, business partners and suppliers continue to make the island a hub for valuable, high-end IT expertise," said Edward Yu, general manager of IBM Taiwan, at an opening ceremony for the new center. Taiwan's geographic proximity to the fast-growing China market and other emerging markets in Asia, is another reason why IBM decided to set up the center in the country. The lab is expected to increase its high-end research workers by 10 percent in 2011. IBM has invested over NT \$ 100 billion in the research and development of Power Systems servers during the past four years, representing 13 % share of the company's research budget per year.

"IBM's new center in Taiwan will enable the company to share high-value technology with its business partners, promote its R & D capabilities, and respond to clients' needs immediately," said Simon Lin, chairman of Wistron Corp., which is currently the only Taiwanese supplier of IBM's Power Systems servers. "It will help Taiwan's ODM and OEM industries to successfully transform into high-end, service-oriented and analytics-capability-intensive smart industries capable of utilizing Power Systems for complex computing applications," Lin said.

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201103240042](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201103240042)





## 12. New 'stacked' chip saves research time, cost: CIC

(Central News Agency, 24 03 2011)

Taiwan's National Chip Implementation Center (CIC) released a new method of building IC chips that can cut the development time of chips by two-thirds and the cost by one-half. The new technology allows electronics developers to stack chip modules with different functions on top of each other, thereby saving space and resources on a carrier board. The developers have dubbed their technology "MorPACK" to give it a punchy image of providing a wide array of usage within one tightly-bound package. Chiueh Tzi-dar, the director general of CIC under National Applied Research Laboratories, said MorPACK can cut down development time of chips from 6-9 months to 2-3 months and reduce development costs of each project by as much as NT\$1.5 million. Six universities are already using this technology for their research and development projects. The new technology can be applied to developing chips for any electronic devices, including communications, security, medicine or recreation gadgets, said Huang Chun-ming, head of the development team. Huang explained that every electronic device needs different chips to function and each chip is composed of different modules. For example, for a digital camera's multiple tasks, such as taking pictures, zooming in and out, and detecting faces, each requires a separate module. Using this technology, developers can stack up different modules into one chip instead of laying out modules separately, which would occupy too much space on a carrier board. "We used the concept of building blocks," Huang said, adding that this not only saves board space, but also boosts performance because the circuits are closer to each other. Still in its prototype phase, this new chip technology already has three patents and is applying for another eight worldwide, CIC said. Even though researchers will need time to refine the product, CIC told reporters at the press conference that industry can expect to benefit from this technology by the second half of 2011. The IC industry has been called "Taiwan's national treasure." With an output of NT\$1.76 trillion in 2010, Taiwan has the biggest market share in the global wafer foundry, IC packaging and IC testing industries, according to CIC.

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201103290023](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201103290023)

## 13. Agency develops bridge safety warning system

(Taipei Times, 26 03 2011)

The Institute of Transportation has developed a bridge safety warning system that would give highway authority officials as much as three hours to react to emergency situations. The institute is a research agency that assists the Ministry of Transportation and Communications in developing transportation policies.

<http://www.taipeitimes.com/News/taiwan/archives/2011/03/26/2003499162>

## 14. Fingerprint-free Touch Panel Becomes Possible! National Taipei University of Technology Develops "Diamond Film"

(MEPO Forum, 26 03 2011)

A research team led by Professor Chii-Ruey LIN at the Graduate Institute of Mechanical and Electrical Engineering, National Taipei University of Technology developed a film coated on touch panel with nano-diamond powder, special chemical formula and a unique coating process. The film, called "diamond film" (trans. temp.) is hard, anti-UV, anti-corrosion and high transparent. Especially, no fingerprint can be left on it. The technology has been published in international journal, and won an award in a nationwide competition. The film can be coated on the panel of cellphones, panel computers, e-dictionary, solar batteries, etc. The team also continues the development of the production equipment which allows for the film to be coated on glass or plastic materials and large-sized flat.

<http://web1.nsc.gov.tw/techwp.aspx?id=1000321003&ctunit=208&ctnode=287&mp=7>

## 15. Taiwan Biomedical Researchers Show Hearing Impairment Is Authentic Symptom of Huntington's Disease

(MEPO Forum, 26 03 2011)

*Academia Sinica Newsletter* (2011/03/22) A team of biomedical scientists from Academia Sinica, National Yang-Ming University, Tri-Service General Hospital, Chang Gung Memorial Hospital, and the Veterans General Hospital recently reported that hearing loss is an authentic symptom of Huntington's disease (HD). In addition, the team found that brain-type creatine kinase (CKB), an enzyme important in supplying energy to cells, was reduced in



the cochlea in the inner ear of mice with HD. Most importantly, treatment with creatine supplements ameliorated the hearing impairment of HD mice, hinting that creatine may be an effective treatment for hearing problems in HD patients. The study was published in the *Journal of Clinical Investigation* on March 14, 2011.

The full-text of the study entitled "Dysregulated brain creatine kinase is associated with hearing impairment in mouse models of Huntington disease" is available at the *Journal of Clinical Investigation* website at:

[http://www.the-jci.org/publiTron.php?series\\_id=71&action=review\\_series](http://www.the-jci.org/publiTron.php?series_id=71&action=review_series)

<http://web1.nsc.gov.tw/techwp.aspx?id=1000322002&ctunit=208&ctnode=287&mp=7>

## **16. Researchers in Taiwan link genetic screening with drug side effects**

(Taiwan Today, 29 03 2011)

Taiwan researchers have demonstrated the clinical effectiveness of genetic screening in preventing potentially fatal drug-induced syndromes, Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis, Academia Sinica said. In Southeast Asia, SJS and TEN are most commonly caused by administration of the analgesic and anticonvulsant drug carbamazepine, according to the research team. Chen Pei, researcher at Academia Sinica's Institute of Biomedical Sciences, explained the study was based on a report by an IBMS and Chang-Gung Hospital team in 2004 showing a strong correlation between carbamazepine-induced SJS/TEN and a specific genotype, HLA-B\*1502, found in people of Han Chinese descent. "In the study, involving 5,000 patients at 23 hospitals, doctors screened the patients for HLA-B\*1502 before prescribing carbamazepine," Chen said. "A replacement treatment was used for those found carrying the allele, with the result being that not a single patient developed SJS/TEN." The result "can be considered a milestone in the development of personalized medicine and has made the prevention of drug toxicity with a gene test a clinical reality," the research institute noted. The study was published in the *New England Journal of Medicine* on 24 March.

<http://www.taiwantoday.tw/ct.asp?xItem=158176&ctNode=445>

## **17. Biotechnicians resort to age-old remedy to keep fish healthy**

(Central News Agency, 30 03 2011)

Local biotechnicians have found that feeding fish powdered garlic can help them grow bigger and healthier. Preliminary experiments have found that feeding cobia -- a fish used for sashimi -- a certain amount of garlic for nine consecutive days prevented infections from a marine bacteria, said the Tungkang Biotechnology Research Center, an affiliate of the Cabinet-level Council of Agriculture (COA).

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201103300010](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201103300010)