

28 February 2010

# Science, Technology and Education News from Taiwan Number 02 - February 2010

The Industrial Technology Research Institute (ITRI) received 397 U.S. patents in 2010, the most of any research institute in the world, according to an annual corporate ranking released by IFI Patent Intelligence. ITRI has received a steadily growing number of U.S. patents in recent years, going from 229 in 2007 to 286 in 2008. ITRI filed 2,330 international patent applications last year and was awarded a record high 1,308 patents. The institute hopes not only to obtain more patents in the future but also to enhance the quality of its inventions, it said.

Scientists (incl from Taiwan) are conducting tests in Europe in preparation for the launch of the Alpha Magnetic Spectrometer (AMS), the first large acceptance particle detector designed to operate in space. The Production of the AMS components was a joint effort, with France, Germany, Italy, Portugal, Spain, Switzerland, China, the US and Taiwan making significant contributions. Academia Sinica, the Chung Shan Institute of Science and Technology (CSIST), National Central University (NCU), National Cheng Kung University, National Chiao Tung University, and the National Space Program Office (NSPO) are part of the Taiwanese effort. Most of the detector's electronic equipment was manufactured at the CSIST.Its main computer and trigger system were jointly designed, manufactured and tested by Academia Sinica, NCU, CSIST and the Massachusetts Institute of Technology. The CSIST and NSPO were responsible for thermal modeling and analysis, and the Aerospace Industrial Development Corp produced the AMS ground support equipment and cooling panels.

# Highlights of major news from the scientific world in Taiwan in February 2010:

The government increases budget for lithium battery development – the National Space Organization switches the critical sensor module in its satellite program from CCD system to CMOS – the Science Council plans expanded ocean research – the Institute of Nuclear Energy Research introduced a new touch-screen making machine – local study proves relation between tobacco and lung cancer – Researchers found enzyme structure of mint scent – the Atomic Energy Council developed new applications of plasma overlay technology (ridding of the cadmium contamination problem) – Researchers made diabetes breakthrough – the potential for commercialization of fuel cells in Taiwan, etc.

#### **Contents**

1.	Academia Sinica deputy chief elected FAOBMB president	2
2.	Budget for lithium battery development increased	2
3.	NSPO to switch to Taiwan-made module for satellite	2
4.	Taiwan to promote smart industries	2
5.	Science council plans expanded ocean research	3
3.	Software incubation center launched in Kaohsiung	3
7.	Taiwan's sole B2B e-book platform to launch	3
3.	Local professor tapped to edit prestigious IET publication	4
9.	Institute introduces new touch-screen making machine	4
10.	Researchers find 2 new Antarctic species	4
11.	ITRI, Israeli firm to build WiMAX testing lab	4
12.	Taiwan Wins Big at the 2010 iF Product Design Award	5
13.	Tainan's medicinal herbs receive shot in the arm	5
14.	Taiwanese researchers find enzyme structure of mint scent	5
15.	ITRI ranked as leading patent recipient among research institutes	6
16.	Taiwan International Science Fair 2010 High School Students Show their Creativity	6
17.	Atomic Energy Council Develops New Applications of Plasma Overlay Technology, Ridding of the Cadmium Contamination Problem	6
18.	NCKU Research Team Discovers New Mechanism of Tabacco's Inducing Lung Cancer	7
19.	Taiwanese helping with CERNS space research program	7
20.	EMR to be expanded to hospitals across Taiwan	7
21.	Researchers make diabetes breakthrough	8
22.	Potential for the Commercialization of Fuel Cells in Taiwan	8

# 1. Academia Sinica deputy chief elected FAOBMB president

(Central News Agency, 01 02 2010)

Andrew H.J. Wang, Vice President of Academia Sinica, was elected as the next president of the Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB) and will take office in 2011 for a three-year term. The mission of the FAOBMB, which has members from 18 countries, is to stimulate cooperation between biochemists and molecular biologists in the Asia-Pacific region in an effort to advance research, teaching and applications of biochemistry and molecular biology in the region

#### Full article

http://focustaiwan.tw/ShowNews/WebNews Detail.aspx?Type=aEDU&ID=201002010018

# 2. Budget for lithium battery development increased

(Central News Agency, 03 02 2010)

The government has increased its annual budget for assisting research and development institutes in the development of lithium fuel cells as part of efforts to promote the development of the electric vehicle industry. The budget was increased from last year's NT\$120 million (US\$3.75 million) to NT\$160 million this year.

#### Full article:

http://focustaiwan.tw/ShowNews/WebNews Detail.aspx?ID=201002030022&Type=aECO

#### 3. NSPO to switch to Taiwan-made module for satellite

(Taipei Times, 03 02 2010)

The National Space Organization (NSPO) said that a critical sensor module in its satellite program would be built by a Taiwanese corporation, in keeping with its policy of developing domestic space-related industries. The decision marked a switch by the organization, which has traditionally relied on more mainstream image sensors based on the tried-and-tested charge-coupled device (CCD) system. Officials said the decision to abandon the system was made because of tighter export controls in the US and other countries on high-tech models used in military and satellite imagery. Previous satellite launches by the government-run organization have all utilized the CCD system, which is used to process images shot from space and downlink them to servers based in Hsinchu. The new satellites are expected to use sensors based on complementary metal oxide semiconductors (CMOS), a technology that officials said Taiwan's manufacturing industry currently dominates. They said the image quality of the technology, which has lower power requirements, has caught up with that of the CCD since the development of active pixel sensor (APS) technologies.

FORMOSAT-5 will mark the formal beginning of the "second phase" in satellite development, the NSPO said. While the first phase was marked by overseas procurement, the second phase would emphasize indigenous development of critical technologies, including spacecraft bus and optical remote sensing instruments. The estimated launch date for the satellite is currently pegged at 2013, although officials said this could change pending further testing. The satellite is expected to orbit at an altitude of 720km with an operating lifespan of five

#### Full article:

years.

http://www.taipeitimes.com/News/taiwan/archives/2010/02/03/2003465081

# 4. Taiwan to promote smart industries

(Economic Daily News, 03 02 2010)

The Executive Yuan will invest more than NT\$15 billion over the next six years to promote four key emerging intelligent industries, according to an unnamed Cabinet official. These include cloud computing, intelligent electric vehicles, intelligent green buildings and the commercialization of patents.

From 2010 to 2014, the government will spend NT\$10.09 billion building cloud computing infrastructures, platforms and services. These efforts are expected to bring the gross margins of cloud computing systems produced locally to double digits, as opposed to the single-digit margins of personal computers. The government will also leverage the country's competitive edge to create cloud data centers for budget computers. It will also help other countries

establish their own cloud data centers as part of its efforts to vie for business in a market estimated at US\$10 billion per year.

With regards to intelligent green buildings, the state will invest a total of NT\$2.3 billion between 2010 and 2013 to promote integrations and applications of intelligent green buildings, support the Intelligent Living Space Industry Alliance as well as develop sensor network technologies and services.

The projects to promote intelligent electric vehicles will be carried out in two stages with a total budget estimated at between NT\$2 billion and NT\$3 billion. Special incentives will be offered in the first three years, while personal subsidies and tax credits will be given in the second stage, depending on the economic conditions at the time.

With a budget of between NT\$100 million and NT\$200 million per year from 2010 to 2012, efforts will be made to speed up the reviewing process of patent applications and promote the commercialization of innovation patents. By the year 2012, the estimated time to review applications will be shortened from 36 months to 22 months.

#### Full article:

http://www.taiwantoday.tw/ct.asp?xItem=93550&CtNode=419

#### 5. Science council plans expanded ocean research

(Liberty Times, 04 02 2010)

The National Science Council will spend NT\$1.6 billion to build a flagship oceanographic research vessel, carrying Taiwan's first Remotely Operated Vehicle for deep-sea exploration. Construction is scheduled to begin in March and be completed by June 2012. Exploration of the sea bottom's "inner space" will help establish a national oceanographic databank.

The boat will place earthquake sensors in the deep ocean to monitor seismic activity on the sea bottom in the vicinity of Taiwan, and transport and operate an ROV for exploration of sea floor topography and biology as deep as 3,000 meters. It will conduct biological, chemical, physics and geological research, as well as to study currents, including the interaction of the Kuroshio Current with other currents. The ROV will be able to collect sediments for geological analysis and provide data for earthquake and tsunami alerts, as well as data on natural resources in relation to global climate change.

## Full article:

http://www.taiwantoday.tw/ct.asp?xItem=93612&CtNode=416

# 6. Software incubation center launched in Kaohsiung

(Commercial Times, 04 02 2010)

The Kaohsiung Software Incubation Center (KSIC) will boost software industry development in southern Taiwan. There are currently 119 incubation centers across the island, incorporating over 3,900 companies, including 50 listed companies. The KSIC, in which the MOEA has invested NT\$140 million, can pilot software industries in southern Taiwan into prosperity, according to MOEA.

#### Full article:

http://www.taiwantoday.tw/ct.asp?xltem=93610&ctNode=445

# 7. Taiwan's sole B2B e-book platform to launch

(Taiwan News, 04 02 2010)

Taiwan's sole B2B e-book platform to launch Chinese e-books will soon hit the market like a storm. Consumer electronics and computer companies are rushing to outdo each other in generating new technology and attractive content to cash in on what is the latest trend in the media industry.

I-MEI will use its in-house developed technology integrated with the Digital Rights Management (DRM) of world-famous SafeNet security systems leader. Using the ePub standard, I-MEI has formed alliances with Taiwan's close to a thousand publishing houses to launch itself in a big way in the Chinese e-book market. The company has authorized the publishing houses to use its technology in its e-books.

#### Full article:

http://www.etaiwannews.com/etn/news\_content.php?id=1172785&lang=eng\_news&cate\_img=logo\_taiwan&cate\_r ss=TAIWAN\_eng

## 8. Local professor tapped to edit prestigious IET publication

(Liberty Times, 04 02 2010)

On the heels of his election as a Fellow of the Institute of Engineering and Technology, National Yilan University College of Electrical Engineering and Computer Science dean Han-Chieh Chao will have once more brought home international honors when he takes up duties this March as the Editor in Chief of the IET Communications Journal, making him the only Taiwanese editor-in-chief still resident on the island with responsibility for the journals and articles in the IEL's databases. The university says that Chao's IET job is an unusual honor because, to date, fewer than five scholars in Taiwan have been able to take on such duties.

The IEEE/IET Electronic Library database (IEL) is the source for more than two million full-text articles from the U.S. Institute of Electrical and Electronics Engineers and Britain's Institute of Engineering and Technology, including journal publications and conference proceedings from IEEE and IET since 1988, in addition to IEEE technical standards.

#### Full article:

http://www.taiwanheadlines.gov.tw/ct.asp?xItem=179059&CtNode=9

## 9. Institute introduces new touch-screen making machine

(Taipei Times, 09 02 2010)

E-book readers and cellphones with flexible and bendable touch screens are some of the products that could benefit thanks to a new machine unveiled by researchers at the state-run Institute of Nuclear Energy Research. Ai Chi-fong, director of the institute's physics division and one of the researchers on the project — the first of its kind in Taiwan — said that while a majority of touch screens are manufactured using glass, his process allows the use of plastic, which is less fragile, ultimately making the process cheaper and more environmentally friendly. The machine uses a manufacturing process involving plasma to create rolls of indium tin oxide (ITO) film, which are an essential component of plastic touch screens. Similar machines made abroad — which are not widely available — cost between NT\$100 million (US\$3.1 million) and NT\$120 million.

The machine allows the application of film to plastics at room temperatures, overcoming earlier problems where plastics would melt or become unusable because of the high temperatures that were needed.

Other researchers at the institute said the machine could also be used in other sectors. Plasma coating, which is a core feature of the machine, can also be used in construction and industrial tools, researchers said, adding that it may also have military applications.

# Full article:

http://www.taipeitimes.com/News/taiwan/archives/2010/02/09/2003465547

## 10. Researchers find 2 new Antarctic species

(China Times, 09 02 2010)

A team of three Taiwan scientists taking part in a mainland Chinese scientific expedition to Antarctica has discovered two marine species never before found on the polar continent. The specimens of the marine invertebrates—the "sea tongue" and "fuzzy red star fish"—are among some of the many biological samples collected by the scientists during their research mission.

## Full article:

http://www.taiwantoday.tw/ct.asp?xItem=94071&ctNode=445

## 11. ITRI, Israeli firm to build WiMAX testing lab

(Central News Agency, 09 02 2010)

The Industrial Technology Research Institute (ITRI), Taiwan's leading technology research institute, and Israeli company Alvarion Ltd., the world's leading provider of WiMAX and wireless broadband solutions, announced that they will set up an Interoperability Testing (IOT) lab for WiMAX at the ITRI. Taiwanese WiMAX product suppliers will no longer need to ship their products abroad for testing.

## Full article:

# 12. Taiwan Wins Big at the 2010 iF Product Design Award

(Taiwan Economic News, 09 02 2010)

Taiwan designers came home with 76 awards in the 2010 iF Product Design Award, the 'Oscar' of the design world. The 76 wins represented about almost one-tenth of all the award categories. The jury evaluated 2,486 products from 1,016 entrants in 38 countries, selecting 778 for the coveted awards.

The Taiwan entries are also well poised to join the list of 50 winners of the iF Gold Award for `best in competition,` which will be announced during the awards ceremony on March 2, 2010, the first day of CeBit international computer show in Hanover, Germany.

The BenQ Group was the biggest winner in 2010 iF Product Design Award as its flagship firm BenQ Corp., an international 3C (computer, communication, and consumer electronics) brand, won eight prizes, while its affiliated QisDesign (the design business division of Qisda Corp., which focuses on OEM/ODM manufacturing) won nine prizes, the most among all local counterparts.

The information and communication technology (ICT) industry was again the strongest of the Taiwan sectors in the award running. Assisted Computer Inc. won eight prizes, Lite-On Technology Corp. won six, and MiTAC International Corp. took home four prizes.

#### Full article:

http://cens.com/cens/html/en/news/news inner 31183.html

#### 13. Tainan's medicinal herbs receive shot in the arm

(Liberty Times, 10 02 2010)

After devoting itself to organic medicinal herbs cultivation for nearly a year, Tainan City's medicinal herbs production and marketing team recently received its first major order for 10,000 kilograms of Wedelia chinesis (Osbeck) Merr. from a biotech company, a sign that the team's efforts are starting to pay off.

However, since Wedelia chinesis (Osbeck) Merr. is not frequently seen in the wild, the enormous order has proven somewhat troublesome for the team, which has been looking all over for seedlings for cultivation in the hope that it will be able to make the delivery by the end of 2010.

Wedelia chinesis (Osbeck) Merr. is a type of chrysanthemum whose larger version can be frequently seen in the wild with double petals; the smaller type of the flower that has only single petals is valuable from a medicinal perspective but is rare in Taiwan, said Yan Rong-hong, head of the team, adding that it is quite difficult to get one's hands on these seedlings, which have not been spotted by the team in quantity. They hope that farming industry people can provide some assistance in this respect.

#### Full article:

http://www.taiwantoday.tw/ct.asp?xItem=94162&CtNode=419

## 14. Taiwanese researchers find enzyme structure of mint scent

(Central News Agency, 12 02 2010)

Taiwan's top research institute Academia Sinica said that researchers have detailed the structure of an enzyme involved in the production of the scent given off by the mint plant, and added that the research was published in American journal "The Plant Cell" in its Feb. 5 issue.

In an effort to better understand the process by which the mint plant produces scent, Academia Sinica Vice President Andrew HJ Wang and his team from the Institute of Biological Chemistry (IBC) used x-ray crystallography, as well as biochemical and genetic studies, to solve the structure of an enzyme that catalyzes the first critical step in the biosynthesis pathway of the mint scent formation.

The volatiles that evaporate from plants to produce scent are very important in nature to attract pollinators and herbivorous predators and emit signals that ward off pathogens. They are also of interest to humans as medicines; however, very little is known about them.

The group discovered that the enzyme is composed of two different proteins - a catalytic protein and a regulatory protein. Through protein-protein interactions, the regulatory protein can remodel the active-site cavity of the catalytic protein for synthesizing the precursor of menthol, which is released from the plant as mint scent.

The article, titled "Structure of a Heterotetrameric Geranyl Pyrophosphate Synthase from Mint (Mentha piperita) Reveals Intersubunit Regulation" is available on The Plant Cell Web site at http://www.plantcell.org/cgi/content/abstract/tpc.109.071738 v1.

Full article:

http://focustaiwan.tw/ShowNews/WebNews Detail.aspx?ID=201002120025&Type=aLIV

Related article:

http://web1.nsc.gov.tw/techwp.aspx?id=0990219001&ctunit=208&ctnode=287&mp=7

## 15. ITRI ranked as leading patent recipient among research institutes

(Central News Agency, 12 02 2010)

Taiwan's nonprofit Industrial Technology Research Institute (ITRI) received 397 US patents last year, the most of any research institute in the world, according to an annual corporate ranking released by IFI Patent Intelligence. ITRI has received a steadily growing number of US patents in recent years, going from 229 in 2007 to 286 in 2008. The 397 patents it received last year made it the only R & D research institute to rank among the world's top 50 corporate patent recipients in 2009, according to the IFI ranking. The top placing is a result of ITRI efforts to encourage its researchers to create innovative, high value inventions and to develop new technology and new industries that can stay competitive in the global market, an ITRI spokesman said Friday. ITRI filed 2,330 international patent applications last year and was awarded a record high of 1,308 patents. The institute hopes not only to obtain more patents in the future but also to enhance the quality of its inventions.

Full article:

http://focustaiwan.tw/ShowNews/WebNews\_Detail.aspx?ID=201002120032&Type=aSOC

## 16. Taiwan International Science Fair 2010 High School Students Show their Creativity

(National Science Council, 12 02 2010)

Taiwan International Science Fair 2010, which has participants from 13 countries, held the awarding ceremony on February 5. Seventy-six among the hundreds of entries were awarded, and twenty-three students were selected to represent Taiwan participating the science fairs in the US and Canada etc. Yung-kang Chen from Taichung First Senior High School, awarded the zoology champion, used high-speed camera to capture the motions of a kind of salticidae (jumping spider), by analyzing which Chen found the explanations about how the spider keeps its balance by utilizing the dragline force and tilting its body, and how it makes a safe landing by using the elastic restoring force of the spider silk. Chen wished to apply the findings to the design of the rescue equipment. Hsin-buo Wang from Taipei Municipal Jianguo High School, the winner of mathematics prize, used the concepts of remainder processing and weighted-average to decide how to take the least boxes from those filled with various objects however satisfying the taker's desire. The method developed by Wang was also applicable to decide the daily collocation of food sufficing for standard diet.

Full article:

http://web1.nsc.gov.tw/techwp.aspx?id=0990206001&ctunit=208&ctnode=287&mp=7

# 17. Atomic Energy Council Develops New Applications of Plasma Overlay Technology, Ridding of the Cadmium Contamination Problem

(National Science Council, 12 02 2010)

Institute of Nuclear Energy Research, Atomic Energy Council, has presented three novel applications of plasma overlay technology, which will benefit not only the plastic injection manufacturing industry and the touch panel industry but also the environment protection.

Screw is the most needed component for plastic injection manufacturing, but the traditional screws are easy to be worn out. The instant high energy density caused by the plasma overlay can thrice strengthen the abrasion resistance and corrosion resistance of the screws. Secondly, plasma overlay, which is a clean process, can replace cadmium plating process so that cadmium contamination can be avoided. Besides, plasma overlay is successfully applied to make the key material for touch panel, *viz.*, the flexible conductive film, and hence the predicament of relying on other countries is resolved.

Full article:

http://web1.nsc.gov.tw/techwp.aspx?id=0990209001&ctunit=208&ctnode=287&mp=7

# 18. NCKU Research Team Discovers New Mechanism of Tabacco's Inducing Lung Cancer

(National Science Council, 13 02 2010)

A research team from NCKU (National Cheng Kung University), led by Professor Yi-Ching WANG of the Department of Pharmacology, College of Medicine, and supported by the National Research Program for Genomic Medicine, discovers a new mechanism of tobacco induced lung cancer. The achievement brings forth new clues for cancer prevention and treatment; it is also selected as the cover story of the 2010 February Issue of the Journal of Clinical Investigation. In addition to the known carcinogenesis mechanism of gene mutation induced by the tobacco-specific carcinogen NNK in lung cancer, the team of NCKU Professor Yi-Ching WANG discovers a new carcinogenic mechanism, viz., the inhibition of the tumor suppressor genes' performance due to the abnormal accumulation of the DNA methytransferaese (DNMT) in nucleus induced by NNK. DNA methyltransferase 1 (DNMT1) catalyzes DNA methylation and is overexpressed in many human diseases, including cancer. The tobacco-specific carcinogen NNK also induces DNA methylation. However, the role of DNMT1-mediated methylation in tobacco carcinogenesis remains unclear. The team adopts human and mouse lung cancer samples and cell lines to determine a mechanism whereby NNK induced DNMT1 expression and activity. The cell-based experiments show that the tobacco-specific carcinogen NNK activates AKT signaling, inhibiting GSK3ß function and thereby attenuating DNMT1 degradation and prolonging DNMT1 protein stability. Besides, NNK is also found to induce βTrCP translocation to the cytoplasm via the heterogeneous nuclear ribonucleoprotein U (hnRNP-U) shuttling protein, resulting in DNMT1 nuclear accumulation and hypermethylation of the promoters of tumor suppressor genes. This result directly proves the significant correlation between NNK and the occurrence of lung cancer.

#### Full article:

http://web1.nsc.gov.tw/techwp.aspx?id=0990211006&ctunit=208&ctnode=287&mp=7

#### Related article:

http://www.chinapost.com.tw/taiwan/national/national-news/2010/02/09/244163/Local-study.htm

# 19. Taiwanese helping with CERNS space research program

(Taipei Times, 16 02 2010)

Scientists are conducting tests in Europe in preparation for the launch of the Alpha Magnetic Spectrometer (AMS), the first large acceptance particle detector designed to operate in space. Many people, however, may not know that Taiwanese scientists are part of the project. The European Organization for Nuclear Research (CERN) says 15 countries are participating in the AMS experiment, which was designed by an international team of physicists led by US Nobel laureate Sam Ting.

Production of the AMS components was a joint effort, with France, Germany, Italy, Portugal, Spain, Switzerland, China, the US and Taiwan making significant contributions, CERN said.

Academia Sinica, the Chung Shan Institute of Science and Technology (CSIST), National Central University (NCU), National Cheng Kung University, National Chiao Tung University, and the National Space Program Office (NSPO) are part of the Taiwanese effort.

Lin Chih-hsun, an associate research scientist from Academia Sinica's Institute of Physics, said most of the detector's electronic equipment was manufactured at the CSIST. Its main computer and trigger system were jointly designed, manufactured and tested by Academia Sinica, NCU, CSIST and the Massachusetts Institute of Technology. The CSIST and NSPO were responsible for thermal modeling and analysis, and the Aerospace Industrial Development Corp produced the AMS ground support equipment and cooling panels. The main scientific purpose of AMS is to search for dark matter and antimatter. Lift-off aboard the space shuttle Discovery is scheduled for July.

## Full article:

http://www.taipeitimes.com/News/taiwan/archives/2010/02/16/2003466000

# 20. EMR to be expanded to hospitals across Taiwan

(China Post, 22 02 2010)

The Department of Health (DOH) is introducing an Electronic Medical Records and Data Interchange as part of a Hospitals Subsidy Scheme to promote the use of Electronic Medical Records (EMR) in hospitals. The aim of the

three-year, NT\$6 billion, scheme is to avoid redundant medical tests, prescriptions and insurance claims, creating a win-win-win situation for patients, hospitals and insurance companies.

EMR are currently used in 92 hospitals. The records include information on blood tests, medical images, admission records and patient's prescriptions. The scheme also aims to extend the use of EMR to the 500 hospitals nationwide — provide subsidies based on the size of each hospital. The smaller the hospital, the larger the subsidy will be.

Full article:

http://www.chinapost.com.tw/taiwan/national/national-news/2010/02/22/245347/EMR-to.htm

#### 21. Researchers make diabetes breakthrough

(China Times, 24 02 2010)

Researchers in Taiwan have identified two loci involving genes that may increase susceptibility to type 2 diabetes among the Han Chinese population. The discovery, recently published online in "PloS Genetics," a reputable genetics and genomics research journal, could lead to the development of therapeutic gene modulation drugs in the future that could reduce the incidence rate of diabetes in adults. According to Wu Jer-vuarn from Academia Sinica's National Genotyping Center, leader of the Taiwan research team, the two identified loci in and around the genes' protein tyrosine phosphatase receptor type D and serine racemase were not previously known to be linked to diabetes. While people of all races possess the two genes, the variants that they produce in Han Chinese substantially increase the risk of type 2 diabetes among individuals in this group by 50 percent, the researchers found. In the search for diabetes susceptibility genes, Wu's research team obtained blood samples of 2,798 type 2 diabetes patients from China Medical University Hospital, National Taiwan University Hospital and the Chia-Yi Christian Hospital. They then used gene chip analysis techniques to carry out the genome-wide association study. Wu noted that the novel T2D risk loci may involve genes that are implicated in insulin sensitivity and control of glucagons and insulin secretion. More specifically, PTPRD may participate in the regulation of insulin action on its target cells, while SRR variants may alter glutamate signaling in the pancreas, thus regulating insulin and glucagon secretion. According to Wu, the interaction of these two genes may cause the body cells to "reject" insulin's intended effects, with glucose in the blood unable to enter cells, thereby raising blood sugar levels. Their research achievements are expected to significantly help in the design and development of new diabetes drugs and represent a major breakthrough in diabetes prevention medicine. The "invisible killer" diabetes ranks as the fourth main cause of death in Taiwan. Roughly 1.2 million people on the island are diabetics, with an additional 600,000 suffering from latent diabetes. A further statistic pointing to the severity of the problem in Taiwan is the fact that treatment of the disease accounts for roughly one-eighth of the National Health Insurance system's annual costs.

Full article

http://www.taiwantoday.tw/ct.asp?xItem=94862&ctNode=445

# 22. Potential for the Commercialization of Fuel Cells in Taiwan

(Wilson Center)

Taiwan could potentially play a useful role in answering the call for near-term commercialization of fuel cell technology. The island is renowned for its manufacturing capability and is especially suitable for international collaboration to transform new technology into low-volume products at a reasonable price in the development stage. It is already ahead of many countries in establishing public-private partnerships for fuel cell research and commercialization. However, it is somewhat behind other countries in coordinating strategic planning for fuel cell infrastructure and commercialization. This analysis is meant to highlight the potential of new policies in Taiwan an international collaboration on fuel cell commercialization. The paper concludes with a discussion of the four core problem in fuel cell development in Taiwan, along with recommendations on how to remedy these shortcomings.

Full article:

http://www.wilsoncenter.org/topics/docs/taiwan fuel cell english.pdf