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Taiwan inventions shine at exhibition in Geneva: Almost every one of Taiwan's 95 entries won a medal at the International Exhibition of Inventions in Geneva. Taiwanese inventors received 37 gold medals, 39 silvers, 16 bronzes and 6 special awards, said Chen Tsung-tai. The inventions recognized by a special award include a far infrared-based facial mask and a walking stick with a directional indicator. Taiwan's inventions were praised by the judges for their functionality and for their success in cross-industry cooperation.

A Taipei research team has developed a new kind of **visible laser wireless internet technology** that can transmit information at ultra-fast speeds. The researchers say it is up to 100 times faster than the latest 4G technology. Researchers at National Taipei University of Technology spent three years and more than NT\$20 million to develop ultra-fast wireless internet that relies on visible laser light. It takes less than a second to download a film requiring 4.5 gigabytes of memory.

Fifteen submissions were selected to enter the second and final round for the **Tang Prize** - an annual design competition dubbed the "**Asian Nobel Prize.**" The winner will be announced on 22 May. The Tang Prize Foundation says it received a total of 245 designs by local students and professionals this year.

*The **French-Taiwanese Cultural Foundation** was established in 1996 under the aegis of the French Academy for Social and Moral Sciences with the purpose of "awarding every year two prizes for artistic or literary works that shed light on relations between Taiwan and Europe and/or contribute to the enhancement of cultural exchange between Taiwan and Europe." Each prize rises to €25,000. Any natural person or legal entity from any European country or from Taiwan, who subscribes to the Foundation's objectives, may apply. Candidates must produce research, proposed cultural projects, reports, publications, artistic creations, etc., - completed or still in progress - directly related to Taiwan. After filling in the form below (in French, Chinese, English or German) and enclosing the documents such as literary works, research or other cultural projects, together with letters of recommendation, the candidates should send the application for the current year, before June 30th to :Académie des sciences morales et politiques, Fondation culturelle franco-taiwanaise, 23, quai de Conti - 75006 Paris. Applications will be submitted to the members of the Foundation's examining committee - French academicians and Taiwanese academics - in Paris or Taipei. The prize-winners will be notified by the Academy and invited to attend the Award ceremony at the Institut de France in Paris. Download the application form at: http://www.france-taipei.org/IMG/pdf/Formulaire_fondation.pdf*

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The 13th European Education Fair in Taiwan: 17 October in Tainan, 18-19 October in Taipei; 120 exhibitors from 10 European countries; 8'000 visitors expected; Introduction: <http://youtu.be/kEnpFwyCwgU>; Now: [online registration system](#) for exhibitors.

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1. Taiwan pioneers edible oil colorant testing methods

(Taiwan Today, 08 04 2014)

A Taiwan-developed method using high-performance liquid chromatography to identify the food coloring agent copper chlorophyll in edible oils is being validated by the International Olive Council, according to ROC Food and Drug Administration April 7. The HPLC-based testing method, which was developed by the administration, is a means of determining the presence of the illegal green colorant in adulterated oil products posing as olive oil—especially extra virgin, FDA division head Cheng Hwei-fang said. By performing the HPLC analysis, it is possible to identify and quantify synthetic copper chlorophyll complex, which is not permitted in vegetable oils in most countries worldwide. Under IOC regulations, no additives except alpha-tocopherol are allowed in olive oil. After publishing its research method Jan. 28, the FDA sent a five-member delegation backed by ministries of Economic and Foreign Affairs to take part in a council-convened chemical analysis meeting last month in Madrid. Experts from 16 olive oil-producing states, as well as the EU, took part in the session at which it was decided that the method will be submitted to ring tests in approximately 20 laboratories. If research results prove valid, Cheng said, the method could be adopted as a council-referenced testing standard by year-end at the earliest.

<http://www.taiwantoday.tw/ct.asp?xItem=216189&ctNode=445>

2. ITRI unveils mobile health care devices

(Taiwan Today, 11 04 2014)

Seven state-of-the-art mobile health care devices were unveiled by ROC government-backed Industrial Technology Research Institute April 10 in Hsinchu County, northern Taiwan. The ITRI-developed devices are nanosecond pulse near-field wristbands for monitoring heart rates, blood pressure and driver fatigue; an ultra-wide band technology smart mattress; a sensor for asthma symptoms; a patch made of biocompatible materials for rapid wound closure, and an electrocardiogram patch. In addition to seniors, these cutting-edge applications are expected to benefit patients suffering asthma, diabetes and heart diseases, according to ITRI. The smart mattress, jointly developed by the ITRI and New Taipei City-based SEDA Medical Products Co. Ltd, is the first of its kind that can inhibit obstructive sleep apnea. It helps the patient resume normal breathing by adjusting the angle of the mattress without disrupting sleep. Another world first is the asthma sensor. The ITRI is working with Taoyuan County-based Chang Gung Children's Hospital in the second-stage clinical trials for the sensor. First-stage trials with Taipei City-based National Taiwan University Hospital have been completed. ITRI President Shyu Jyuo-min said the applications, which require coordinated efforts among the nation's makers of integrated circuits and sensors to achieve mass production, are expected to help Taiwan firms thrive in international niche markets. The ITRI is assisting Taiwan's mobile health care sector to reach greater heights. Citing a study by U.S.-based BCC Research LLC, market revenues for related devices hit US\$860 million in 2013 and is estimated to rise to US\$3 billion in 2018, ITRI said. In recent years, ITRI has worked tirelessly in the promotion of biomedical research, setting up spin-off companies and making technological transfers to local biomedical businesses, the institute said.

<http://www.taiwantoday.tw/ct.asp?xItem=216285&ctNode=445>

3. Taiwan researchers release bee study results

(Liberty Times, 15 04 2014)

A National Taiwan University research team unveiled the results of a seven-year bee study April 14 in Taipei City, demonstrating how collapse of the insect's colonies might be linked to a certain pesticide. The study shows the pesticide called imidacloprid can seriously harm worker bees' sense of orientation, smell and learning ability, NTU professor and team leader Yang En-cheng said. Bees instantly lose their ability to return to hives after given a 50 parts per billion solution of the pesticide, he added. The study also shows that as the team increased the solution concentration, more bees were affected and lost their way to the hives, Yang said. Since colonies depend on worker bees to collect honey and pollen, once they are disoriented by the pesticide, the colonies face the specter of collapse. Yang said that even if worker bees make their way back to the hives, they might still pass some of the pesticide to younger bees, damaging neurological systems. As the annual output value of bee products in Taiwan is NT\$2.3 billion (US\$76 million), Yang said, bee colony collapse poses a serious problem. More than 40 kinds of local agricultural produce depend on bees for pollination, he added. The researchers gave 600 bees solutions of five different imidacloprid concentrations. Comprising NTU professors from the fields of bio-industrial mechanics engineering, electrical engineering and entomology, the cross-discipline team utilized far-infrared ray, image recognition and radar to track the location of the four observed colonies. Yang said though worker bees usually return to their hives within five minutes after collecting honey, the study shows the bees became restless, repeatedly used their sensors to scratch their eyes, stopped flying and even died after being given a solution of 40 ppb of imidacloprid. The EU banned farmers from using imidacloprid and other nicotine-derived systemic insecticides in 2013 to protect bee colonies, but the product is still allowed in Taiwan, Yang said. In response, the Council of



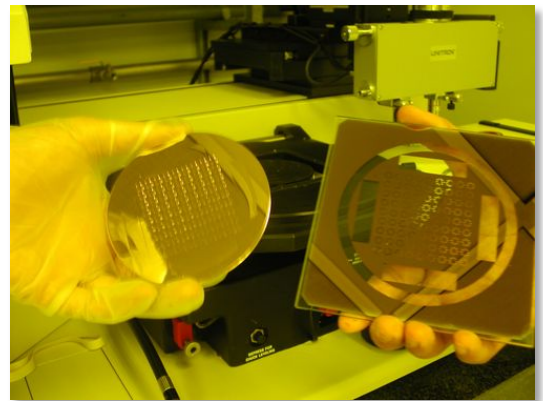
Agriculture under the ROC Executive Yuan said it has implemented a series of evaluation procedures to consider limiting or prohibiting farmers from using insecticides that pose a high risk for bees, including imidacloprid. The agency has also directed local pesticide manufacturers to carry labels warnings of the effect of their products on bees, the COA said. Starting November 2013, the council requires manufacturers to provide product testing information on their products' influence on bees when registering new pesticides

<http://www.taiwantoday.tw/ct.asp?xItem=216415&ctNode=445>

4. TSMC biggest R&D spender in local manufacturing sector

(Central News Agency, 15 04 2014)

Taiwan Semiconductor Manufacturing Co. (TSMC), the world's largest contract chip maker, ranked as the biggest spender in research and development in 2013 among the 1,024 local manufacturers listed on the main board and the over-the-counter market in 2013, government statistics showed. Citing the statistics, the Ministry of Economic Affairs (MOEA) said TSMC spent NT\$48.1 billion (US\$1.59 billion) in R&D in 2013, up 19.1 percent from the previous year. It was the fourth consecutive year that TSMC posted a double digit increase in R&D spending, the ministry said. Market analysts said the increase in TSMC's R&D spending reflected solid global demand for mobile devices and chips made on the chip manufacturer's high-end technology process. Hon Hai Precision Industry Co., the world's largest contract electronics maker which assembles iPhone and iPad for Apple Inc., was the second biggest spender in 2013, increasing its research and development spending by an annual 2.1 percent to NT\$46.6 billion. Integrated circuit designer MediaTek Inc. was third, with R&D spending of NT\$26.5 billion, up 18.2 percent from the previous year. According to the statistics, the local electronic component segment spent NT\$231.2 billion in R&D, accounting for 46.8 percent of the total NT\$494.0 billion spent by the 1,024 manufacturers last year. The computer and optoelectronics segment took up NT\$175.8 billion, 35.6 percent of the total R&D spending in the manufacturing sector, the data showed. The fixed asset investments of the 1,024 manufacturers fell by an annual 5.3 percent in 2013 to NT\$1.17 trillion but the decline was less than the 14.5 percent year-on-year drop in 2012, the statistics indicated. The electronics component segment invested NT\$605.9 billion in fixed assets last year, down 1.7 percent from the previous year. The segment accounted for 52 percent of the total fixed asset investments TSMC also ranked as the biggest investor in fixed assets last year, pouring in NT\$287.6 billion, ahead of China Steel Corp. with NT\$60.7 billion and Hon Hai with NT\$44.4 billion. In 2013, the total net profit of the 1,024 manufacturers rose 69 percent from a year earlier to NT\$966 billion, while the net profit margin stood at 4.3 percent, up by an annual 1.8 percentage points, the economics ministry said. The net profit margin of the electronics component segment rose by an annual 5.4 percentage points to 7.7 percent in 2013 as the profitability of semiconductor suppliers improved, the ministry said.



<http://focustaiwan.tw/news/aeco/201404150019.aspx>

5. Taiwan team makes leap in laser data transmission

(Taiwan Today, 17 04 2014)

A Taiwan research team led by professor Lu Hai-han of National Taipei University of Technology's Department of Electro-Optical Engineering has scored a double breakthrough in the speed and distance of red laser-based data transmission, the ROC Ministry of Science and Technology said April 16. Lu's system transmits data at 10 gigabits per second over a distance of up to 17.5 meters, meaning that a 90-minute movie can be downloaded in under half a second. An important feature of light-based communication systems is that they can be used in places such as hospital operating theaters or airplane cockpits to reduce or prevent electromagnetic interference. The team is already working hand in hand with local manufacturers to roll out a commercial version of the system, with a production prototype slated to be ready by June and full-scale manufacture sometime next year. The breakthroughs are a great success for the MOST-funded Fiber Optics CATV and Optical Communications Industry





and Academic Alliance, under which technology transfer for this project in recent years has amounted to NT\$3.2 million (US\$106,000). Previous attempts to develop similar systems based on light-emitting diode, or LED, light sources reached an upper limit of 1 Gbps and about 5 meters. In the future, the team aims to increase the rate of reliable data transmission by the system to 400 Gbps, deemed the next major breakthrough in the development of visible-light communication technology to facilitate cloud server data transmission. Lu's team has been working for several years in this field, with six papers published in journals Optics Express and Optics Letters in the past three years, including one article honored by the former as top download. The work has also been covered by U.K.-based science journal New Scientist. Lu was elected a fellow of the International Society for Optics and Photonics this year for his achievements in fiber-optic communications.

<http://www.taiwantoday.tw/ct.asp?xItem=216518&ctNode=445>

6. Cancer drug approved for phase one clinical trials

(Taipei Times, 23 04 2014)

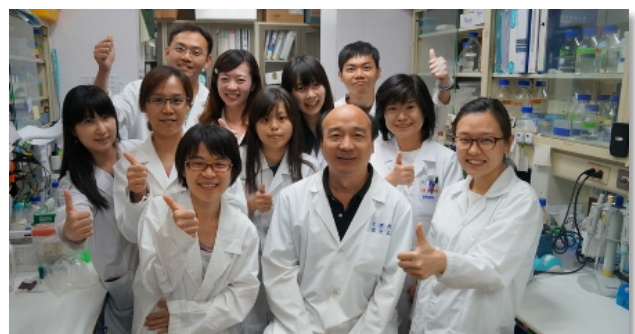
The Development Center for Biotechnology (DCB) said it will collaborate with four local companies to conduct phase one clinical trials of a cancer drug, with total spending of NT\$100 million (US\$3.31 million). The DCBCI0901 drug, developed by the government-funded center, is aimed at treating lung, breast and prostate cancer. It has won approval from regulators in Taiwan and the US for use in phase one trials. "We will start the phase one trials immediately at hospitals in Taiwan, which are expected to take at least one year," center president Jeff Wang said at a press conference. The center has spent three years conducting preclinical trials, along with Standard Chemical & Pharmaceutical Co, YungShin Global Holding Corp., China Chemical & Pharmaceutical Co. and Intech Biopharm. They have spent a total of NT\$250 million, including NT\$25 million from the four companies, on the preclinical trials, DCB said. Wang said it would be up to the four firms to decide whether to finish all the trials before launching the drug on the market themselves or to license the drug to other companies before completing all procedures. Standard Chemical chief executive officer Roy Fan said the four firms hope the government will provide subsidies for the phase one trials, while they pick up the rest of the tab. Patents for DCBCI0901 have been secured in 16 countries, including Taiwan, Japan and the US, the center said. Citing WHO statistics, the center said global sales of cancer drugs totaled US\$61.6 billion in 2012, and the amount is expected to increase to between US\$74 billion and US\$84 billion in 2017. DCBCI0901 will be used as a targeted cancer therapy in the future and its potential market is expected to be US\$36 billion next year, the center said. Fourteen million people were diagnosed with cancer worldwide in 2012, and 8.2 million people died from cancer that same year, the center said, citing a WHO report. Sales of cancer drugs in Taiwan in 2012 amounted to NT\$22.9 billion, accounting for 16.9 % of total drug sales of NT\$135.4 billion that year, the center said. There were 480,000 people diagnosed with cancer nationwide last year, and the number is expected to reach 500,000 this year, the center said, citing statistics from the Health Promotion Administration.

<http://www.taipeitimes.com/News/biz/archives/2014/04/23/2003588649>

7. ROC biologist honored by SEBM

(Taiwan Today, 23 04 2014)

Tsai Shaw-jeng, professor of Tainan City-based National Cheng Kung University's Physiology Department, has been selected for a Distinguished Scientist Award by U.S.-based Society for Experimental Biology and Medicine, NCKU said April 22. According to the university, Tsai is one of two scientists worldwide, the other from Russia, awarded the honor this year. He is the second Taiwan awardee after Chang Nan-shan, director of NCKU's Institute of Molecular Medicine, who won in 2011. SEBM President Rex Gaskins praised Tsai's innovative research in a congratulatory message, NCKU said. Tsai said that many people, including students, assistants, the institute and most importantly patients taking part in the research, contributed to the achievements that had made the award possible. Tsai's research has focused on endometriosis, in which cells from the uterine lining flourish outside the uterus, and how cancer cells develop drug resistance, NCKU said. According to Tsai, endometriosis is a common but currently incurable gynecological condition. After beginning his research on the problem more than a decade ago, in 2010 he published papers on the subject that drew promises of collaboration from U.K. and U.S. pharmaceutical companies. Prospects for a cure are looking brighter, he said.



Professor Tsai Shaw-jeng (front, center) of NCKU's Physiology Department poses with his research team at NCKU in Tainan City. (Courtesy of NCKU)



Tsai's team also discovered that cancer cells develop drug resistance as the pressure of treatment induces hypoxia in the cells, which in turn causes change in gene regulatory networks. Established in 1903, SEBM encourages biomedical research, particularly through promoting interdisciplinary exchanges. It has more than 1,000 members and selects one or two outstanding biologists for the Distinguished Scientist Award every year. This year's presentation ceremony will be held April 27 during the society's annual meeting in San Diego, California.

<http://www.taiwantoday.tw/ct.asp?xItem=216717&ctNode=445>

8. Taiwan flash memory inventor wins lifetime award

(Taiwan Today, 25 04 2014)

Taiwan researcher Simon Min Sze, a national endowed chair professor of electrical engineering at Hsinchu City-based National Chiao Tung University, was honored with this year's Lifetime Achievement Award by the U.S.-based Flash Memory Summit, NCTU said April 24. NCTU hailed Sze's 1967 co-invention of floating gate non-volatile semiconductor memory (NVSM), which gave rise to numerous memory devices including flash memory, as the most important of his fundamental and pioneering contributions to electrical engineering. NVSM has enabled the development of modern electronic systems, including such varied inventions as smartphones, ultrabook computers, automatic braking systems in vehicles and GPS devices, NCTU said. Sze's invention of NVSM was originally inspired by a layered piece of cheesecake eaten by a South Korean co-worker, Dawon Kahng, at U.S.-based Bell Telephone Laboratories, NCTU said. According to NCTU, Sze has also made groundbreaking contributions to semiconductor devices, especially metal-semiconductor contacts, microwave devices and submicron metal-oxide-semiconductor field-effect transistor technology. The award is the latest in a long line of domestic and international honors for Sze, who has received Taiwan's National Science and Technology Prize and is also an academician at Taipei City-based Academia Sinica. Sze joined National Chiao Tung University from 1990 to 2006 as a distinguished professor, following a 27-year stint at Bell Labs. Sze has authored or co-authored more than 200 technical papers, as well as written and edited 16 books, NCTU said. His 1969 textbook "Physics of Semiconductor Devices" is one of the most cited works in contemporary engineering and applied science publications, which has been translated into six languages with more than 1.5 million copies printed, according to NCTU. Presentation of the award will be made Aug. 5 at the Flash Memory Summit in Santa Clara, California, which is the most important global gathering for those involved in the flash memory field, NCTU said.



<http://www.taiwantoday.tw/ct.asp?xItem=216796&ctNode=445>

9. HPP technology applied to extend food expiration dates

(The Liberty Times 25 04 2014)

High Hydrostatic Pressure (HPP) technology, which sports a variety of applications in many aspects, including ceramic-made or high-intensity electronic components, was first applied to the food processing industry by a local inventor, Liao, Ri-xing, three years ago. He also filed over 20 applications to claim-related patents. Liao used the technology to preserve food essences extracted from local agricultural and aquatic products, such as pineapples, mangoes, perch fish, etc., by killing germs in them before preserving the food at low temperatures.

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=335691&CtNode=9>

10. Taipei hospital achieves liver transplant milestone

(Central News Agency, 28 04 2014)

Medical teams at Taipei Veterans General Hospital completed the first living-donor domino liver transplant in Taiwan in late 2013, saving two lives during a 12-hour operation, the hospital said Monday during a presentation of the results. Six years ago, the hospital's liver transplant team performed the first domino liver transplant in Taiwan using a liver from a deceased donor with a successful outcome, and it built on that feat on Dec. 25, 2013, this time using part of a liver from a live donor. Domino liver transplantation refers to a procedure in which part of a donor's liver is transplanted into a second person who then donates part of his or her liver to a third person. The idea is that



the second person's liver may not function in his or her own body, but can still function in the body of another patient with a different kind of problem. One of those receiving a liver transplant in this case was a man surnamed Chen who began experiencing weakness and numbness in his leg in January 2012 and was later diagnosed with familial amyloidotic polyneuropathy (FAP). A liver transplant helps patients with FAP to control their illness. Three medical teams consisting of 20 doctors first took part of the left lobe of the liver of Chen's son and transplanted it into the father. They then took part of the right lobe of Chen's liver and transplanted it into a woman in her 50s surnamed Huang, who had liver cancer. Originally suffering from hepatitis C and liver cirrhosis, she was judged to need a liver transplant after being rushed to the hospital in June 2012 when she lost consciousness due to liver failure and was found to have a tumor in her liver. Demand for liver transplants is high and cannot be met by the supply of organs donated by the deceased, while regulations covering living-donor liver transplants are strict, leading to a bottleneck in liver transplants, said Loong Che-chuan, head of the hospital's Department of Surgery. In this case, the domino liver transplant has so far been successful, Loong. said. More than 1,000 domino liver transplants have been performed around the world, he said.

<http://focustaiwan.tw/news/asoc/201404280041.aspx>

11. Biological Chemists discover that Lysine 33-linked Ubiquitin Chains Function in Protein Trafficking

(Academia Sinica, 28 04 2014)

A team led by Dr. Ruey-Hwa Chen, a Distinguished Research Fellow at the Institute of Biological Chemistry recently discovered that lysine (K) 33-linked ubiquitin chains function in protein trafficking. Ubiquitin is a small molecule that is 76 amino acids in length. Polyubiquitination is the attachment of a chain of ubiquitin molecules to a protein. Among the amino acids that make up ubiquitin seven lysines – K6, K11, K27, K29, K33, K48, and K63 – and the methionine (M1) may serve as points of ubiquitination. Scientists understand the functions of the K48- and K63-linked ubiquitin chains reasonably well, but the functions of the chains that form at the other lysines remained unknown. The discovery of the function of K33-linked ubiquitin chain in cells advances understanding in this field. The research was published in the top molecular and cell biology journal *Molecular Cell* on April 24, 2014. In the study, the scientists found that an enzyme named Cullin3 ubiquitin E3 ligase which contains KLHL20 as the receptor of the substrate can catalyze K33-linked ubiquitination on a protein named coronin 7 (Crn7). Crn is known to regulate actin, the protein that forms microfilaments that make up a large part of the cytoskeleton (scaffolding) of the cell. This atypical ubiquitin chain connects Crn7 to a ubiquitin-binding protein named Eps15 that is localized in the cellular organelle named the Golgi apparatus. This connection enables actin assembly at the Golgi apparatus that promotes transport of cell materials out of the Golgi apparatus (termed post-Golgi transport) through vesicles. Since post-Golgi transport in the cell is essential for many physiological processes, such as hormone secretion, immune responses, and neural transmission, the study also provides new insights into these important processes.

http://www.sinica.edu.tw/manage/gatenews/showsingle.php?_op=?rid:6620%26isEnglish:1