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**Science, Technology and Education News from Taiwan  
Number 08 – August 2010**

- Among the categories of expenditure in the **2011 budget proposal**, education/science/culture accounts for 20 % of the total expenditure of NT\$ 1.7896 trillion, followed by social welfare with 19.4 %, national defense with 16 % and economic development with 12.6 % as proposed by the cabinet
- The Cabinet approved Taiwan's first **"Creative and Cultural Industries Development Research Institute"** on 26 August, a project that promises to develop the industry and boost integration among participants. It will promote innovative products, protect patents and cultivate top-tier output in related field. The R&D center, which is modeled along the lines of the Hsinchu-based Industrial Technology Research Institute, will receive initial government funding of NT\$30 mio. Additional revenue is expected to come from research projects, consulting services, products sales and donations.
- At the **8th National Education Meeting**, organized by the Ministry of Education, on 28/29 August, participants (representatives from schools and parent and student organizations) continued to urge MOE to extend Taiwan's compulsory education from 9 to 12 years. Other key issues addressed included enhancing citizenship education at all school levels, promoting awareness of gender equality and lifelong arts education, revising the Educational Fundamental Act to ensure the balanced distribution of educational budgets among municipalities as well as formulating a child care services act.

**Highlights of major news from the scientific world in Taiwan in August 2010:**

Researchers developed a technique to use silkworm pupas to produce caterpillar fungus, which is a valuable Chinese medicine – A new soil sterilization technique allows to double vegetable production – A potent anti-oil pollution biotool was discovered by students – Scientists made a breakthrough in stem cell research by finding a safe way to turn umbilical vein cells into induce-pluripotent-stem-cells – Physicists found a new method to probe neutrino magnetic effects – A medical team of Chang Gung hospital developed a new brain cancer treatment – The Council of Agriculture unveiled a rice variety with high resistance to disease – A robotic system was applied for the first time in stomach cancer surgery – A new technology speeds up orchids' growth – researchers developed a computerized vehicle-tracking system – Scientists developed a "cellular mass spectrometer" with new functions – Taiwan and Canada developed a new method for hepatitis C detection – Researchers identified protein behind vitamin C uptake – Researchers created a new pen-size plasma sterilization device – Academia Sinica made a breakthrough in brain degeneration studies – A waterproof LED was developed for yachts

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### **1. Taiwan develops technique to produce Chinese medicine ingredient**

(Central News Agency, 04 08 2010)

Taiwan has successfully developed a technique to use silkworm pupas to produce caterpillar fungus, which is a valuable Chinese medicine. The breakthrough was achieved by planting parasitic fungus in four-week-old silkworm pupas, said the researchers at the Miaoli District Agricultural Research and Extension Station under the Cabinet-level Council of Agriculture.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201008040044](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201008040044)

### **2. New soil sterilization technique doubles vegetable production**

(Liberty Times, 04 08 2010)

A technology using the physical properties of steam as a principle to perform sterilization has been released recently by the Agricultural Research Institute under the Council of Agriculture, allowing vegetables with relatively low heat tolerance, such as cabbages, to grow large and rapidly, as well as cultivation using almost no chemicals, doubling the value of the produce.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=198867&CtNode=9>

### **3. Potent anti-oil pollution biotool discovered by local students**

(Liberty Times, 05 08 2010)

A local Taiwanese organism, the *Gordonia* bacterium, has been found to be able to break down diesel oil, motor oil, and salad oil, a discovery made by four second-year local students from the National Overseas Chinese Experimental High School in Taipei County, winning them first-place honors in the high school science division of the 50th annual National Secondary and Primary School Science Fair.

Full articles:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=198969&CtNode=9>

<http://www.taiwantoday.tw/ct.asp?xItem=113331&ctNode=445>

### **4. Scientists make breakthrough in stem cell research**

(Taiwan Today, 10 08 2010)

Researchers at the National Health Research Institutes and National Taiwan University have found a safe way to turn umbilical vein cells into induced-pluripotent-stem-cells (iPSC), which have the potential to generate specific specialized cells, such as blood and liver cells. Yen Linju, associate investigator at the NHRI's Institute of Cellular and System Medicine, was quoted in local newspapers as saying that her team was able to transform human umbilical vein endothelial cells, or HUVECs, into iPSCs by using only two non-cancer-causing genes, OCT4 and SOX2. The study appeared on 6 Aug online ahead of print publication, on the website of *Arteriosclerosis, Thrombosis, and Vascular Biology*, a journal published by the American Heart Association

Full article:

<http://www.taiwantoday.tw/ct.asp?xItem=113859&ctNode=445>

### **5. Physicists find new method to probe neutrino magnetic effects**

(Central News Agency, 10 08 2010)

A local research team has recently discovered a new method to detect possible neutrino electromagnetic interaction, a discovery that will increase experimental sensitivity by more than 100 times, a researcher with Taiwan's top research institute Academia Sinica said. "The feature of the new method is that we unveiled a mechanism of atomic ionization



for the detection of neutrino magnetic moments and demonstrated great enhancement in sensitivity," said team leader Henry Tsz-king Wong, a research fellow for the Institute of Physics at Academia Sinica. He described neutrino magnetic moments as a scientific term used to indicate possible neutrino electromagnetic interaction. Data analyses and experimental projects exploiting this idea are being planned in other laboratories," said Wong, who was a researcher at the European Organization for Nuclear Research (CERN) from 1992 to 1996. The findings were published in the Physical Review Letters journal 2 Aug.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201008100021](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201008100021)

## **6. Chang Gung team develops new brain cancer treatment**

(Central News Agency, 11 08 2010)

A Taiwanese medical team developed a new way to fight brain cancer that combines ultrasound techniques and the use of magnetic particles to deliver more drugs to the brain than previously possible with non-invasive techniques.

Full articles:

[http://www.etaiwannews.com/etn/news\\_content.php?id=1343371&lang=eng\\_news&cate\\_img=logo\\_taiwan&cate\\_rss=TAIWAN\\_eng](http://www.etaiwannews.com/etn/news_content.php?id=1343371&lang=eng_news&cate_img=logo_taiwan&cate_rss=TAIWAN_eng)

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201008100020](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201008100020)

## **7. Taiwan unveils rice variety with high resistance to disease**

(Central News Agency, 11 08 2010)

The Council of Agriculture (COA) unveiled a new variety of rice that it said is highly resistant to rice blast disease and will therefore have high yield and low production costs. The Tainung No. 84 variety was produced after more than eight years of effort by the Chiayi Agricultural Experimental Station of the COA's Agricultural Research Institute..

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=199708&CtNode=9>

## **8. Robotic system applied to stomach cancer surgery**

(Central News Agency, 12 08 2010)

The Tri-Service General Hospital announced the first domestic application of the da Vinci robotic surgical system to gastric cancer. The system, commonly used for prostatectomies and cardiac valve repair, consists of interactive robotic arms that are controlled by surgeons from a console.

During the surgery, only four small incisions (1-2 cm) are made into the stomach so that the medical instruments can be introduced. The robotic arms can move freely inside the body without restriction, helping surgeons to excise cancerous tissue and lymph nodes.

Full article:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201008120042](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201008120042)

## **9. Tainan researchers' technology speeds up orchids' growth**

(Taipei Times, 14 08 2010)

A new technology to encourage phalaenopsis, or butterfly orchids, to produce inflorescences, or flower spikes was developed by the Tainan District Agricultural Research and Extension Station in Tainan County's Sinhua Township. The technology, which took more than four years to develop, could shorten the period it takes for the delicate orchid to spike to between 15 to 42 days.

Full article:

<http://www.taipeitimes.com/News/taiwan/archives/2010/08/14/2003480348>



#### **10. Researchers develop computerized vehicle-tracking system**

(Central News Agency, 17 08 2010)

Researchers at the Industrial Technology Research Institute in Hsinchu City have developed a computerized system that can help track the movement of vehicles on roads. In the new system developed by the institute, a computer can replace the humans needed to review the tapes. The system transforms the features of the vehicle, including its color, plate number -- even only a few letters of the plate -- the vehicle type and other vital information into digital data and then examines the tapes for similar vehicles. It is much quicker and more exact than screening performed by people, and the system can work with the existing security camera system.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=200389&CtNode=9>

#### **11. Taiwanese scientist's invention can weigh cells**

(Liberty times, 17 08 2010)

Chen Chung-hsuan, director of the Genomics Center at Academia Sinica, worked with colleagues on a "cellular mass spectrometer" with new functions. The new devices are capable of measurements that are 10 billion times finer than earlier mass spectrometers. Using this device, a determination can be made as to how many nanoparticles a cell has eaten, or how much medication has actually entered it. The instrument can also be used to see whether cancer cells at the early stages are excreting biological or chemical compounds, and thereby find a chemical compound that is a marker for that cancer. Most recently, the team at Academia Sinica has been busy with a 16-kilogram "portable mass spectrometer" that is not only light and small, but capable of measuring at the cellular level.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=200305&CtNode=9>

#### **12. Taiwan, Canada develop new method for hepatitis C detection**

(Central News Agency, 19 08 2010)

Researchers from Taiwan and Canada have developed a new microscopy technology that allows for low-cost, portable imaging of the hepatitis C virus, making it more convenient to conduct screenings. The device creates images from cell samples that allow researchers to determine whether the hepatitis C virus is present. The development is expected to help sharply increase the efficiency of the diagnosis of chronic hepatitis C, Kao said in a press release. The size of the device allows for point-of-care testing, which is diagnostic testing at or near the site of patient care. The goal of the collaboration project between Taiwan and Canada is to develop real-time, unobtrusive and efficient biomedical detection methods and instruments for widespread application for hepatitis C and other infectious diseases.

Full article:

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=200620&CtNode=9>

#### **13. Research identifies protein behind vitamin C uptake**

(Central News Agency, 21 08 2010)

Researchers from Academia Sinica's Institute of Biomedical Sciences have identified a protein that carries vitamin C to muscle cells of the body to help repair damage and protect against deterioration. The study was published online in the journal Human Molecular Genetics on 24 July and has been highlighted as a "must read" paper by the influential "Faculty of 1000 Biology" research service. The findings of the study may explain long-standing questions about how vitamin C enters mitochondria, which are the power centers of cells. These findings provide a mechanism to explain how vitamin C enters mitochondria and show how abnormalities in GLUT 10 may lead to the abnormalities found in arterial tortuosity syndrome. The results also provide new insights into the relationship between GLUT 10 and type 2 diabetes and underline the importance of vitamin C in fighting degenerative diseases.



Full article:

<http://www.taipetimes.com/News/taiwan/archives/2010/08/21/2003480949>

#### **14. Taiwan researchers create pen-size plasma sterilization device**

(Central News Agency, 24 08 2010)

Local researchers have achieved a breakthrough by succeeding in developing and producing a pen-size device capable of sterilizing instruments and wounds, even in hard-to-reach places, that could have widespread medical and preventive uses in the future. The handy device, introduced by National Cheng Kung University (NCKU) in Tainan, can eliminate common bacteria such as e. coli, staphylococcus aureus and thermophilic bacilli within 90-120 seconds. The research team has begun cooperating with the university hospital to conduct clinical trials using the device to disinfect

Full articles:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aALL&ID=201008240013](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201008240013)

<http://www.taiwantoday.tw/ct.asp?xItem=115121&ctNode=445>

#### **15. Academia Sinica makes breakthrough in brain degeneration studies**

(Central News Agency, 27 08 2010)

Using the model will bring scientists closer to developing efficient drugs to treat FTLN patients. According to Academia Sinica, Taiwan's highest academic research institute, FTLN is associated with atrophy in the frontal and temporal lobes of the brain that can lead to memory loss, impairment of language ability and sometimes motor neuron disease. The research team, led by Academician Che-Kun James Shen at the the Institute of Molecular Biology, found an abnormal level of a type of cellular protein known as TAR DNA binding protein 43 (TDP-43) in the brains of FTLN sufferers. The protein, which is capable of affecting neural cell activity, should exist in the nucleus of a cell but is found at an increased levels in the cell plasma of people with FTLN, Tsai said. In the study, the researchers genetically engineered mice with increased levels of TDP-43 in the forebrain. They discovered that the mice exhibited symptoms that mimic FTLN. "The finding that increased levels of TDP-43 protein in the forebrain are sufficient to cause FTLN and possibly other neurodegenerative diseases yields a new avenue for future studies of FTLN," said the institute in a statement. It pointed out that Shen's research team has already started to test a few drugs with potential for treating FTLN and that a collaboration project with an Australia-based laboratory has also been established to conduct drug screening.

Full articles:

[http://focustaiwan.tw/ShowNews/WebNews\\_Detail.aspx?Type=aLIV&ID=201008270022](http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aLIV&ID=201008270022)

#### **16. Taiwan-based Dutchman develops waterproof LED**

(Liberty Times, 27 08 2010)

Dutchman Martyn Castelein, an authorized surveyor of vessels based in Taiwan, has designed a waterproof light-emitting diode light for use on yachts.

Full articles:

<http://www.taiwantoday.tw/ct.asp?xItem=115567&ctNode=445>