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News Highlights:

Taiwan signed a memorandum of understanding with a European research consortium to enhance interaction on transnational nanotechnology research in materials science and engineering – a group of scientists from the Academia Sinica Institute of Astronomy and Astrophysics joined an international project to install a gigantic digital imaging camera on Subaru Telescope to unravel mysteries of dark energy - Chang Gung Memorial Hospital entered a partnership with GlaxoSmithKline to set up a clinical research center for drug trials - A new rice variety has been developed that could help increase the volume of production by 70 % - a Ph.D. student at National Pingtung University of Science and Technology (NPUST)'s Department of Food Science has successfully extracted enzyme-modified pectin from fruit peels to replace hazardous chemical material such as clouding agents and emulsifiers - a research team found potential drugs for alleviation and treatment of frontotemporal lobar degeneration (FTLD), which is one of the main causes of dementia – researchers have been able to increase understanding of the molecular mechanism of antibiotic resistance in the Staphylococci bacteria - Taiwan's Industrial Technology Research Institute received runner-up honors in two categories of The Wall Street Journal's 2012 Technology Innovation Awards, with its products SideLighter in the energy category and aePLASMA in manufacturing technology – researchers at National Cheng Kung University developed a technology using the immune systems from a series of animals to stimulate faster than normal meat growth in domesticated livestock and fish – scientists at Academia Sinica found a link between the transport of proteins inside plant cells and age, which could help increase understanding of the aging process – the Environmental Protection Administration announced a breakthrough in developing a method for achieving higher precision levels in dioxin testing.

Contents:

1.	Gigantic Digital Imaging Camera Installed on Subaru Telescope to Unravel Mysteries of Dark Energy	2
2.	Taiwanese honored for promoting scientific ties with France (update)	2
3.	Taiwan signs deal on nanotechnology research with European network	2
4.	Local hospital partners with pharma giant on clinical research	3
5.	Local university develops aromatic new rice strain	3
6.	Doctoral student turns fruit peels into gold	3
7.	Academia Sinica Research Team Has Found the Drugs for Frontotemporal Lobar Degeneration Treatment	4
8.	Academia Sinica's Biological Chemistry Researchers Find New Protein-DNA Interaction, Broaden Understanding of Molecular Mechanism of Antibiotic Resistance of Staph	4
9.	ITRI wins Wall Street Journal technology honors	5
10.	Scientists hail meat growth tests	5
11.	ROC sets new course for biotech development	6
12.	NCKU to test ocean current turbine off Taitung	6
13.	Taiwan announces new protein findings	6
14.	More precise dioxin test developed	7



1. Gigantic Digital Imaging Camera Installed on Subaru Telescope to Unravel Mysteries of Dark Energy

(Academia Sinica Nesletter, 26 09 2012)

An international collaboration of astronomers led by the National Astronomical Observatory of Japan (NAOJ) and including a group of scientists from the Academia Sinica Institute of Astronomy and Astrophysics (ASIAA) installed a gigantic digital optical camera on the Subaru Telescope on August 16-17. The Hyper Suprime-Cam (HSC) increases the Subaru Telescope's field-of-view seven times and will help researchers unravel current hot topics in astrophysics, such as the mysteries of dark energy and dark matter and the cause of the accelerating expansion of the universe. The HSC is an enormous 870-megapixel ultra-wide-field camera that weighs 3 tons and stands 3 meters high. Its main components facilitate the capture of high-resolution images of faint objects in the far distant Universe. The HSC greatly increases the field of view of the Subaru telescope's wide-field imager from the 0.5 degrees achieved with the current wide-field imager (named Suprime-Cam) to 1.5 degrees. The HSC incorporates cutting edge technology such as 116 innovative, highly sensitive charge-coupled devices (CCDs); a wide field corrector, which corrects for optical aberrations and atmospheric dispersion; and a new prime focus unit. "The HSC is truly the most powerful optical camera ever built. It will allow the scientific teams to study the nature of dark matter and dark energy. This is the first time that Taiwan has participated in the development of frontier instrumentation in optical astronomy. We are looking forward to the participation of Taiwan in this wonderful scientific adventure," remarked the Director of ASIAA, Dr. Paul HO. Associate Research Fellow at ASIAA, Dr. Keiichi UMETSU further enthused: "The combination of exceptional wide-field capability and excellent image quality makes HSC the ideal instrument for cosmological studies. The new survey data will provide critically important constraints on our understanding of the universe." The Subaru HSC project marks the first collaboration between ASIAA and the Subaru Telescope. It is also the first project on which Taiwan astronomers have worked with an 8-10 meter class telescope. The HSC team was established in 2008. Major collaborators include the NAOJ; the Kavli Institute for the Physics and Mathematics of the Universe, Japan; the University of Tokyo; ASIAA; Princeton University, and several companies from the industrial sector. "The development of HSC has provided an excellent opportunity for ASIAA to be involved in an advanced astronomical instrument" said Dr. Shiang-Yu WANG, the leader of the HSC project at ASIAA. "We did not only experience technological challenges, but also the cultural differences and group spirit for the best of the instrument." "The Subaru Telescope is the flagship telescope of the NAOJ. It is one of the largest and most advanced optical telescopes in the world and is located at the summit of Mauna Kea in Hawaii.

<http://web1.nsc.gov.tw/techwp.aspx?id=1010929001&ctunit=208&ctnode=287&mp=7>

2. Taiwanese honored for promoting scientific ties with France (update)

(Central News Agency, 02 10 2012)

Lee Yuan-tseh, former president of Academia Sinica and a chemistry Nobel laureate, was honored by the French government for his contribution to scientific exchanges between Taiwan and France. Lee was presented with the Grand Officer in the National Order of Merit, which was founded by former French President Charles de Gaulle in 1963. In presenting the medal, the French Office in Taipei praised Lee for helping to strengthen scientific ties between the two sides. Lee has walked the talk that "science has no boundaries," said Olivier Richard, director of the office. "More importantly, you have helped promote cultural exchanges between Taiwan and France," Richard said, thanking Lee for lending a Taiwanese aboriginal art piece to the country in 2000 when he served as president of Academia Sinica. In response, Lee said he is thrilled to accept such an honor from the French government, adding that he is marveled by the country's openness to different cultures. "No matter where you come from, Asia or Africa, people are respected in France," Lee said, adding that he is also impressed by the achievements of female French scientists. As a result of Lee's efforts, the two countries now work together on more than 160 science projects each year, the office said. Lee's title was the fifth class of the order, one of the two highest decorations in France. The other is the Legion of Honour, which is generally reserved for French citizens. In an interview with the Taiwan media, Lee said his two goals in life are to "become a good scientist" and "create a beautiful world with people who share the same beliefs." To this end, he is leading a project called "Future Earth," in his role as president of the International Council for Science, one of the biggest non-government organizations devoted to international cooperation in science. The 10-year international research initiative, which will become operational next year, aims to develop knowledge for responding effectively to the risks and opportunities associated with global environmental change in the coming decades, according to the council.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201210020043

3. Taiwan signs deal on nanotechnology research with European network

(Central News Agency, 03 10 2012)

Taiwan signed a memorandum of understanding with a European research consortium to enhance interaction on transnational nanotechnology research in materials science and engineering. The deal was signed at the opening ceremony of the Taiwan Nano Exhibition tech fair by representatives from Taiwan's National Program on Nano



Technology (NPNT) and the M-era.Net network, a European research program on materials. Wu Chung-yu, program director of the NPNT, said the memorandum allows Taiwanese academic institutes and companies to participate in joint nanotechnology research projects with European counterparts from October. "Taiwan is good at making nanotechnology materials and the members of the European research network also value our development in semiconductors and information technology," Wu said on the sidelines of the ceremony. "I hope our industry sector can build partnerships with foreign companies through this platform, so that our products can more easily be promoted in their countries in the future," he said. M-era.Net is a European Union-funded network which has been established to support and increase the coordination of European research programs and related funding in materials science and engineering, according to its official website. Between February 2012 and January 2016, the consortium aims to support the exploitation of knowledge along the whole innovation chain from basic research to applied research and innovation, the website said. Roland Brandenburg, project coordinator of the network, told CNA that the consortium's project is open to partners outside Europe, such as Taiwan, and will create a global network of public funding programs. Over the next four years, each member country will budget about 1 million euros (US\$1.29 million) to fund the project, with the actual amount depending on the size of the country, Brandenburg said. The network consists of 25 European countries and 37 funding organizations, of which 29 are national and 8 are regional. Taiwan joined the network in 2011, becoming the first non-European country member. The consortium is also seeking the participation of funding organizations from Brazil, Canada, Japan, South Korea and the United States.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201210030023

4. Local hospital partners with pharma giant on clinical research

(Central News Agency, 05 10 2012)

The Linkou branch of the Chang Gung Memorial Hospital entered a partnership with pharmaceutical giant GlaxoSmithKline (GSK) to set up a clinical research center for drug trials. The center will focus on drugs for geriatric chronic disease and infectious diseases such as Severe Acute Respiratory Syndrome, which usually breaks out in urban areas in Asia, as well as skin cancer. There will also be further studies on diseases that affect only a small percentage of the world population, such as Fabry disease, GSK said. The drug maker said the partnership will allow it to use Asian patients for testing its products, which have been well-tested on humans of other ethnicities. While the GSK has been working with various local hospitals to conduct clinical trials, its collaboration with Chang Gung will contribute to more consistent tests, said James Shannon, GSK's chief medical officer. On the other hand, patients in Chang Gung could also get greater access to treatment, the hospital said. "This new research center will not only allow Taiwanese people to take advantage of the latest GSK pharmaceutical products but will also promote Taiwan's medical development internationally," said Hospital Superintendent Wenneng Weng. GSK said it will further invest in more than 20 specific research projects with the hospital in the fields of rare diseases, vaccines, respiratory diseases and oncology over the next five years.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201210050018

5. Local university develops aromatic new rice strain

(Central News Agency, 09 10 2012)

A new rice variety has been developed that could help increase the volume of production by 70 percent compared to two other types of rice, a local university said. The new grain, named Ya Ta No. 168, has an aroma of corn and a thicker stem that helps the plant resist wind damage, said Lin Jyun-yi, chair of Asia University's College of Health Science, which developed the new strain. He described the grain as a "revolutionary breed," saying that compared to Taigeng No. 9 and Tainong No. 67, which can yield seven metric tons of rice per hectare, Ya Ta No. 168 can produce up to 13 metric tons per hectare. Lin said regular rice crops take about 120 days in spring and 100 days in autumn to grow to maturity, giving two harvests per year. In comparison, Ya Ta No. 168 takes 15-20 fewer days to grow and can be harvested for a third time in winter in southern Taiwan, he said. Lin said the college took five years to develop the grain and will apply for intellectual property rights from the Council of Agriculture. The college will then distribute seed to local rice farmers next year, he added.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aALL&ID=201210090037

6. Doctoral student turns fruit peels into gold

(Liberty Times, 12 10 2012)

Two years after the 2011 local food safety scandal triggered by the use of plasticizers, Huang Pin-xiu, a Ph.D. student at National Pingtung University of Science and Technology (NPUST)'s Department of Food Science, has successfully extracted pectin from fruit peels to replace the hazardous chemical material, earning a US\$200,000 cooperation plan from U.S. enterprises. Instructed by NPUST Professor Wu Ming-chang and Professor Wang Yu-tai



of Hsing Wu University, the 30-year-old Hwang's achievement in extracting enzyme-modified pectin from fruit peels to replace clouding agents and emulsifiers, both of which are a type of food additive, has earned a U.S. patent, as well as interest from the country's food industries. Professor Wu contends that fruit peels, especially those of citrus fruits, constitute the most abundant portion of discards in the United States, and Hwang's research was able to turn them into gold, with the extracted pectin priced at the half of the clouding agents, as well as the health-beneficial finding of pectin itself, intriguing the U.S. Department of Agriculture's research center covering the eastern part of the country, and serving as a cooperation bridge between Taiwan and the U.S. As a result, Hwang started an eight-month academic exchange program at the invitation of the USDA research center beginning in February of this year. Reflecting on himself as a student who was never that interested in books, Hwang believes it was his fondness of food that led him into the current course of food science. Although he has received offers to work in the U.S., he intends to apply for a teaching job in Taiwan, as "Taiwan is absolutely capable of putting its agriculture and food technologies onto the international stage." His sight-broadening trip to the U.S. also encouraged him to share his experiences with local students so that they can develop better connections with the world.

<http://www.taiwanheadlines.gov.tw/ct.asp?xItem=285865&CtNode=9>

7. Academia Sinica Research Team Has Found the Drugs for Frontotemporal Lobar Degeneration Treatment

(MEPO Forum, 16 10 2012)

Academician Che-Kun James Shen at Institute of Molecular Biology, Academia Sinica recently has been cooperating with Professor Kuen-Jer TSAI at Institute of Clinical Medicine, National Cheng Kung University, leading the research team successfully to find potential drugs for alleviation and treatment of frontotemporal lobar degeneration (FTLD) in Taiwan. FTLD is one of the main causes of dementia, and so far no medication can be used. The research team used autophagy activator -rapamycin to treat the mouse model of FTLD pathology. The result of this research has been published in an important international journal, *Proceedings of the National Academy of Sciences of the United States of America*, PNAS. The pathological and clinical syndrome of FTLD includes the brain atrophy of frontal and temporal lobe, memory loss, speechless, neuromotor disorders, and even would be complicating with motor neuron disease. In the elderly population over the age of 65, FTLD is the fourth most common causes of dementia, only after Alzheimer's disease, Lewy body dementia and vascular dementia. However, FTLD is the second common causes of dementia preceded by to Alzheimer's disease in the populations less than 65 years old. Recent studies have found the mis-metabolism of a protein, which can affect neuronal activity named TDP-43, is correlated to several neurodegenerative diseases, including FTLD and amyotrophic lateral sclerosis, ALS. Previously the research team led by Professor Tsai had transgenically overexpressed TDP-43 in the forebrain of a mouse, successfully developing an animal 34 model existing phenotypic characteristics mimicking of FTLD. The research team applied autophagy activator to the model mouse in the early stage of pathology, discovering that it not only maintained the learning/memory ability of the animal model but also slowed down the loss the motor function, and reduced cytosolic overexpression TDP-43 and its abnormally aggregation, therefore ameliorating the proteinopathy-induced neuronal apoptosis. The research team also showed delivery of the autophagy activators at the late stage of disease progression can ameliorate the motor function. This finding is a major breakthrough for treatment of TDP-43 proteinopathy induced neurodegenerative diseases. Through this study, scientific and medical communities can investigate and improve a more effective application to treat FTLD. Related website:

<http://www.pnas.org/content/109/37/15024.abstract>

<http://web1.nsc.gov.tw/techwp.aspx?id=1011011002&ctunit=208&ctnode=287&mp=7>

8. Academia Sinica's Biological Chemistry Researchers Find New Protein-DNA Interaction, Broaden Understanding of Molecular Mechanism of Antibiotic Resistance of Staph

(MEPO Forum, 16 10 2012)

A recent study by a research team from the Institute of Biological Chemistry (IBC), Academia Sinica, led by distinguished research fellow Andrew H.-J. Wang has increased understanding of the molecular mechanism of antibiotic resistance in the Staphylococci bacteria. The team found that multiple antibiotic resistance regulator TcaR in Staphylococcus epidermidis can bind to single-stranded DNA (ssDNA) and inhibit its replication. It is hoped that the findings, published online in the scholarly journal *PLoS One* on September 21, 2012, will aid the development of new treatments for Staphylococci infection. The Staphylococci bacteria are one of the most common causes of bacterial infection. They can cause a wide variety of diseases in humans through invasion and toxin production, and also by producing biofilm to protect themselves from the host immune system and the action of antibiotics. Staphylococcus aureus is the most well-known species as it the cause of many antibiotic resistant hospital- and community-acquired infections. The protein TcaR from the multiple antibiotic resistance repressor (MarR) family of proteins is known to be responsible for the regulation of antibiotic resistance and biofilm formation in Staphylococci;



however, the detailed mechanism of its action is unknown. In this study, the team used electrophoretic mobility shift assay (EMSA), circular dichroism (CD), and Biacore analyses to show that the TcaR protein can interact strongly and cooperatively with ssDNA, thereby identifying a new role for MarR family proteins. In order to investigate the regulation mechanism of the ssDNA binding ability of TcaR, the team further used electron microscopy to reveal the TcaR-ssDNA complex. Their study also showed that TcaR could inhibit viral ssDNA replication and provide viral resistance against ssDNA phage in *E. coli*. Overall, the study suggests that TcaR plays a role in regulation of DNA replication. The MarR family proteins are involved in multiple antibiotic resistance. They are sensors of changing environments, allowing pathogenic bacteria to survive and persist in a dynamic environment. Up to now, the knowledge of MarR family protein-nucleic acid interaction has been limited to double-strand DNA (dsDNA), this is the first study showing that MarR family proteins also interact with ssDNA. The research was conducted and financed by Academia Sinica and grants from the National Research Program for Biopharmaceuticals, a project funded by the National Science Council of Taiwan. Related website: www.plosone.org

<http://web1.nsc.gov.tw/techwp.aspx?id=1011011001&ctunit=208&ctnode=287&mp=7>

9. ITRI wins Wall Street Journal technology honors

(Taiwan Today, 17 10 2012)

Taiwan's Industrial Technology Research Institute received runner-up honors in two categories of *The Wall Street Journal's* 2012 Technology Innovation Awards. ITRI is the only dual winner this year, with its products SideLighter in the energy category and aePLASMA in manufacturing technology. SideLighter is a "solar-energy technology that concentrates sunlight by directing it sideways to small solar cells at the edge of a panel," while aePLASMA is a "plasma-jet coating process for applying transparent conductive materials to touch-screen displays and photovoltaic products," according to the Journal. Wu Tung-chuang, ITRI executive vice president, said both innovations were developed with green energy concepts in mind and the support of the Ministry of Economic Affairs under its science and technology program. According to Wu, aePLASMA will help address environmental problems brought about by power consumption and the production of toxic materials, while SideLighter allows for the installation of solar panels in a greater range of locations, thereby boosting utilization of this renewable energy source. ITRI has won the Wall Street Journal's Technology Innovation Award or runner-up honor for the past four consecutive years. This year the newspaper received 536 entries from more than 20 countries. A group of editors and reporters selected 172 finalists before an independent panel of judges chose 37 winners and runners-up in 18 categories. The entries were judged on whether they break with conventional processes, make more than marginal improvements and will have a widespread impact.

<http://www.taiwantoday.tw/ct.asp?xItem=197604&ctNode=445>

10. Scientists hail meat growth tests

(Taipei Times, 18 10 2012)

A research team from National Cheng Kung University (NCKU) said it has successfully developed a technology using the immune systems from a series of animals to stimulate faster than normal meat growth in domesticated livestock and fish, which would save on animal feed and help to combat the global food crisis. Developed by a team led by associate professor Chen Tzong-Yueh at NCKU's Institute of Biotechnology, the rapid weight-gain method is said to greatly improve feed conversion rates (FCR, a system for measuring the efficiency for converting feed mass into increased body mass). The team said that as the global population rapidly increases — estimates indicate there will be 8 billion people on the planet by 2030 — there is a growing demand for food, and meat in particular. The International Feed Industry Federation has estimated that global meat and dairy product consumption will rise from about 280 million tons annually to about 800 million tons by the middle of the century. In order to help tackle the problem of the global food crisis, alongside rising prices of animal feed, the team said that it has developed a method using auto-immunity which can stimulate the animal to produce the antibodies that fight against myostatin (a protein that inhibits muscle growth), allowing faster muscle growth. Having conducted experiments on groupers, Chen said "the FCR has reduced by about 20 percent, in other words, for example, where it used to take 1.2kg of animal feed to produce 1kg of fish meat, now it only takes 1kg of feed to produce the same amount of fish meat." Chen said the technology is considered as safe as injecting vaccines into the animals and can help avoid the use of ractopamine or other substances that may remain in the animal's body and cause negative side effects. The team says its innovations have been lauded with several national awards in biotechnology and that the technique is being transferred to firms around the world.

<http://www.taipetimes.com/News/taiwan/archives/2012/10/18/2003545487>



11. ROC sets new course for biotech development

(Taiwan Today, 18 10 2012)

Cultivating homegrown talent and developing medical care services are central planks in the second phase of the ROC government plan to promote Taiwan's biotechnology sector, Minister without Portfolio Chang Shan-cheng said. "The plan for biotechnology development, which commenced in 2009, laid a solid foundation for the local sector," Chang said. "From 2013, the second stage will focus on enhancing Taiwan's talent pool and promoting exports of medical care services." Under the plan, the government will fund an NT\$300 million (US\$10.26 million) three-year talent training program as a way of sharpening the sector's human resource assets. "Taiwan produces 400 graduates with doctoral degrees in biotech-related disciplines every year, four times the average number of openings on offer in the private sector," the minister said, adding that the mismatch bodes ill for industry development. The minister said the government will subsidize local academic and state-funded organizations to create 100 post-doctoral positions in public-private research projects per year. "Such hands-on experience will greatly facilitate the movement of these experts into the private sector." Taiwan has already made tremendous headway in the development of medical devices and pharmaceuticals, Chang said. "Medical care services are a promising field that Taiwan can realistically train its sights on," he said. The government will work with the private sector to identify the kinds of services suitable for export, including turn-key solutions incorporating medical care and information communications technology. It will also encourage the establishment of biotech venture capital firms with funds of between NT\$500 million and NT\$1 billion. "What we plan is the creation of two or three examples of successful investment before setting up mega-funds that require public contribution," Chang said.



<http://www.taiwantoday.tw/ct.asp?xItem=197629&ctNode=445>

12. NCKU to test ocean current turbine off Taitung

(Taiwan Today, 30 10 2012)

National Cheng Kung University's Tainan Hydraulics Laboratory is preparing to install a submerged turbine off the coast of Taitung County in an experiment to generate electricity from the energy of the Kuroshio Current. "If the Kuroshio Current can generate electricity efficiently, it could provide a renewable energy source to replace nuclear power, and create a new industry for Taiwan," researcher Yang Ray-yeng said Oct. 23. If the test is successful in harnessing the energy of the current, which flows north in the Pacific Ocean to the east of Taiwan at a rate of 1 to 1.5 meters per second, it could generate 10 to 15 kilowatts of electricity per second, enough to supply 9,000 households for an hour. With support from the National Science Council, the lab will anchor its ocean current turbine 10 nautical miles from Donghe Township's Jinzun Harbor at a depth of over 100 meters, Yang said. Trial runs with the pilot turbine, designed in Taiwan, have been carried out in the Jianan Canal and Xingda Harbor in Kaohsiung City's Qiding Township, he added. Before mooring the turbine offshore, the research team will meet with fishermen and county government representatives to make sure the turbine does not interfere with fishing. Taiwan's frequent typhoons, earthquakes and northeast monsoons pose other difficulties for the experiment, which is scheduled to test the electricity-generating potential of the current over a two-year period. While Scandinavian countries have already succeeded in yoking ocean currents to produce electricity for small communities and sparsely inhabited islands, their systems are in calmer seas, much shallower water and faster currents, Yang said. "Taiwan has to develop the technology to suit its own conditions," he pointed out.

<http://www.taiwantoday.tw/ct.asp?xItem=197784&ctNode=445>

13. Taiwan announces new protein findings

(Central News Agency, 31 10 2012)

Taiwanese scientists have found a link between the transport of proteins inside plant cells and age, which could help increase understanding of the aging process, Academia Sinica, Taiwan's top research institute, said. A team of researchers led by Academia Sinica's Lee Hsou-min discovered that proteins inside plant cells have their own likes and dislikes in the types of chloroplasts they enter, according to a study published in the scholarly journal PLOS Biology a day earlier. The researchers found during their investigation of pea leaves of different ages, that some proteins prefer older or younger chloroplasts, while others have no special preferences. The chloroplast is the part of a plant cell that conducts photosynthesis and other chemical reactions. The findings reverse the accepted premise that the transport of proteins inside cells, whether plant or animal, is age-independent, the researchers said.

http://focustaiwan.tw/ShowNews/WebNews_Detail.aspx?Type=aTPS&ID=201210310037



14. More precise dioxin test developed

(Taipei Times, 31 10 2012)

BREAKTHROUGH: An EPA lab chief said that with the locally developed reference materials, dioxin testing would not only be more effective, but also cost-saving

The Environmental Protection Administration (EPA) announced a breakthrough in developing a method for achieving higher precision levels in dioxin testing. It is the "poison of the century," the EPA's Environmental Analysis Laboratory said, using a metaphor widely used in the nation to refer to dioxin, whose toxicity is such that a very small amount can have a damaging effect on the human body. Laboratory director-general Roam Guo-dong said that using data accumulated from dioxin testing of fly ashes, bottom ashes and other industrial wastes from the past decade, the laboratory has developed a new solid reference material to support dioxin testing and achieved a precision level higher than in many other countries. "The reference material is the standard used to check the quality of products like correct answers to a test," Roam said. He added that with the new reference material, the laboratory can evaluate whether the testing methods for dioxins used in other laboratories in the business sector or research institutes are able to produce correct test results. Roam said that reference materials for testing dioxins were often purchased from other countries and might not be compatible for testing substances containing dioxin in Taiwan. The locally developed reference material can deliver more precise results in testing for substances collected in Taiwan, he added. It can also save about NT\$7 million (US\$240,000) for the EPA, he said. The laboratory has instructed 10 toxicity testing laboratories — a government agency, three national universities and six environment examination bodies — on using the reference material and is planning to introduce the reference material to the world community.

<http://www.taipeitimes.com/News/taiwan/archives/2012/10/31/2003546539>