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# NEWSLETTER

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SPECIAL ISSUE

## Golden Sun Pilot Project

Chinese Ministry of Finance, Ministry of Science and Technology, and National Energy Administration jointly declared on July 21, 2009 the start of a Golden Sun Pilot Project, in a move to accelerate the scale commercial application of photovoltaic technology in the country, facilitating the development of strategic emerging industries such as new energy, energy efficiency, and environmental protection, and nurturing new economic growth points in the country.

Three government agencies have recently issued a circular on implementing the Golden Sun Pilot Project, stating that efforts will be made to accelerate the scale commercial

application and development of photovoltaic technology through combined financial subsidy, S&T support, and market pull. Within the coming two to three years, financial subsidies will be made available to support the photovoltaic projects at a scale of 500 megawatts or above.

The Circular also states that priority support will be given to photovoltaic grids and independent photovoltaic systems, and to the infrastructure capacity building of related industries, including silicon material purification and grid operation. Subsidies will have an upper limit in line with the state-of-the-art of the technology and market demand. In principle, a subsidy up to 50% of the total cost will be allowed for building a grid based photovoltaic system. For the independent photovoltaic system built in the remote areas without electricity supply, the subsidy may go up to 70% of the total construction cost. Infrastructure capacity building projects will be subsidized mainly through discount government loan.

The Circular asks local grids to support the development of grid based photovoltaic systems, creating desirable conditions for them. Users' grid based photovoltaic system will consume the electricity so generated for their own application, while allowing surplus electricity to be part of the public grid supply, and be charged at full rating defined by the authorities concerned.

## INTERNATIONAL COOPERATION

### China-Japan-Korean Economy and Technology Forum

The 9<sup>th</sup> China-Japan-Korean Economy and Technology Forum, co-sponsored by Chinese Ministry of Science and Technology, Chinese Ministry of Commerce, Japanese Ministry of Economy Trade and Industry, and Korean Ministry of Knowledge Economy, was held July 14-16, 2009 in Yantai. Representative from the three countries' government agencies, research institutes, economic organizations, industry, and universities attended the forum. The Chinese S&T delegation led by counselor WANG Qiming of MOST Department of International Cooperation was part the event.

An S&T forum, co-sponsored by Chinese Ministry of Science and Technology, Shandong Provincial Dept. of Science and Technology, and Yantai Municipal Government, was staged for the first time during the session. Under the theme to diffuse new energy efficiency and environmental protection technologies, and establish a green saving oriented society, the forum was designed to exchange government policies and industrial practice on energy efficiency and environmental protection, especially in terms of techniques, technologies, and applications. Other forums, including business forum, university president forum, logistic forum, and trilateral director talks were also staged during the meeting.

## China-Australia Joint Nanomaterial Lab

A China-Australia Joint Nanomaterial Lab was inaugurated on July 25, 2009 at Xiamen University. According to the agreement signed in 2006 for creating the lab, Xiamen University and the University of Queensland will share their research resources, equipment, and information, accommodate visits and exchanges, including graduate study, and establish an effective and supplementary partnership. Both sides have created a fine foundation for functional nanomaterial studies, enjoying agreeable collaborating environment and rich experience in the area.

RESEARCH AND DEVELOPMENT

## China Sequence Cymbidium Genome

Chinese scientists at both sides of the straits announced on July 20, 2009 that they will have a full genome sequence of Chinese Cymbidium and associated bioinformatic analysis. Meanwhile, scientists will sequence and analyze the transcriptomics of ten major Cymbidium plants. The project will be jointly implemented by Shenzhen Cymbidium Plants Protection and Research Center, Tsinghua University, Beijing Genomics Institute (Shenzhen), CAS Institute of Plant Physiology and Ecology, and Taiwan based National Cheng Kung University.

Prof. Huang Laiqiang at Tsinghua University told reporters that scientists will unveil the evolution story and genetic functions of Cymbidium plants through multidisciplinary means, including bioinformatics, molecular biology, proteomics, metabonomics, biochemistry, and biophysics, based on genome and transcriptomics findings. As an important effort to improve people's understanding of life, the project will create a brand new starting point and platform not only for plants, but also for other related studies, striving to render new contributions to genome studies in the world.

## Tumor Marker Tester

Thanks to multi-year painstaking efforts, Anhui Molecular Medicine Lab has successfully developed a test kit able to pick out tumor markers. With five invention grants, the test kit has been sold to Anhui Puyuan Biotechnology for commercial applications.

The test kit has made detecting blood born tumor cells possible, desirable for diagnosing lung cancer, liver cancer, breast cancer, and chronic myelogenous leukemia, and

metastasis/recurrence tracking and treatment. The technique can be used to monitor metastasis of cancers, and assist doctors to diagnose tumors in their early stage. It can also be used to evaluate the conditions of cancer patients before an operation, providing evidences for preparing a rational chemotherapy and clinical treatment plan.

## Fingerprint Based Breast Cancer Diagnosis

Researchers at Harbin Medical University Tumor Hospital screened out 11 abnormal protein peaks from fingerprint spectrum, and established 3 protein peak specific diagnosing models, which achieved a breast cancer with lymph node metastasis detection rate as high as 83.3%.

The study team, headed by Prof. PANG Da of Harbin Medical University, collected blood samples from 66 breast cancer patients, and obtained original data from protein mass spectrum. Researchers mapped out accurate mass spectrums with the assistance of data and computer, and established screening models through data analysis. They spotted 11 protein peaks different enough to be statistically significant, after comparing notes with the patients' fingerprint spectrum without lymph node metastasis. Three of the protein peaks were built into two major diagnosing models, enjoying a breast cancer with lymph node metastasis detection rate as high as 83.3%.

Study results show that blood serum based fingerprint spectrum is able to effectively tell breast cancer cases from the non breast cancer cases, which eliminates the possibility of lymph node metastasis in biopsy, and makes a substitute for gene and molecular biology based diagnosis that are low in both sensitivity and specificity. The enhanced sensitivity and specificity allow the technique being much more sensitive to the traces of armpit lymph node metastasis, compared with the existing tumor markers. It is a meaningful improvement for earlier diagnosis, better prognosis, and breast removal option.

## Breakthrough Findings on Stem Cells



Xiao Xiao or 'Tiny' made from induced iPS cells.

Funded by Chinese Ministry of Science and Technology for development and reproduction related studies, two Chinese researcher teams, respectively led by ZHOU Qi, a research fellow at CAS Institute of Zoology in Beijing, and by ZENG Fanyi of Shanghai Jiaotong University, created 27 live mice from three induced pluripotent stem (iPS) cell lines. Researchers created more than 1,500 tetraploid embryos, using 6 iPS cell lines selected from 37 iPS cell lines. DNA tests confirmed that the mice are made from induced iPS cells. Some of them have grown old enough to produce their own offspring. So far, researchers have harvested hundreds of second or even third generation mice, the first of their kind in the world. The finding, published in the July 23 issue of online *Nature*, has confirmed the full functionalities of iPS cells.

### Novel Antivirus Compound

Thanks to many-year efforts, a study, led by YANG Zhanqiu, Director of Wuahn University Institute of Virology, has successfully produced a compound that respond to respiratory tract viruses, including Hantaan and H1N1 viruses. The patented finding was published in the recent issue of China Pharmacology. YANG said after taking the drug, the mice infected with Hantaan virus saw improvements in both survival rate and averaged surviving time, with less damage to their liver, kidney, and brain.

Funded by National Natural Science Foundation, scientists are now working on the antivirus mechanisms of the compound. They believe that the compound can be a new drug for treating Hantaan and H1N1 virus infections in the early stage.

NEWS BRIEFS

## Computer Aided Pneumoconiosis Diagnosis

A project to develop computer aided dynamic pneumoconiosis diagnosis technology has passed experts' approval organized by Shanghai Municipal S&T Committee on July 22, 2009. The technology, jointly developed by Shanghai Municipal S&T Committee, Shanghai Lung Hospital, and GE Research Center (China), is able to perform dynamic diagnosis and evaluation of pneumoconiosis through analysis of digitized X-ray images, which has greatly enhanced the accuracy and speed of pneumoconiosis diagnosis. The technology is able to read out results within 54 seconds, while it could take at least 3 minutes for a doctor to tell the same results using traditional techniques.

The technique has been used in Shanghai Lung Hospital on a trial basis. According to GE Research Center (China), the improved technique can also be used to diagnose tuberculosis, lung cancer, and heart disease. It is also meaningful for the prevention and control of contagious diseases such as SARS.

## Digitized Soil Model

It is reported from an S&T infrastructure forum sponsored by the Ministry of Science and Technology that the development of digitized high precision soil model at a scale of 1:50,000 has achieved important progresses. So far scientists have digitized soil conditions for more than 1,100 counties, and established a digital soil model that has covered half of the country. The digital soil model expects to cover 80% of the country in 2012.

Researchers established China's first high precision digital soil model through combined applications of traditional methods, data technology, and geographic information system. The model has preserved the original data collected in the past soil surveys, while leaving the room for future soil surveys, allowing a seamless interface between soil information and basic geographic information.

Researchers also developed an approach to integrate non-standardized massive soil information, and worked out 7 technical standards and procedures, which greatly facilitated the construction of the model. The digital model at a scale of 1:50,000 is not only able to provide more than 100 soil quality indicators for croplands (5 hectares as a unit), but has also realized a linkage between the soil model and soil sections, allowing some 100,000 valuable deep soil sections collected in the past to be part of the model. The addition of a range of elements, including high precision terrains, water systems, and residential areas, allows people to see the impacts of these elements on soil quality.

## Large Automatic Oil Refining System

Not long ago, an automatic oil refining system with an annual capacity of 5 million tons, independently designed and developed by SUPCON, passed the experts' approval.

SUPCON and its collaborators have established standards and associated construction criteria for petrochemical control system, including software/hardware, engineering integration, and services. For example, Wuhan Petrochemical has four patented automatic control systems (ECS-100) for 5 million ton (atmospheric distillation), 1.2 million (delayed coking), 60,000 ton (sulfur recovery), and 1.9 million ton (diesel oil hydrogenation) production lines. The four systems, since being put into operation one after the other through February to October 2008, have been proved safe, stable, and reliable, desirable for large joint petrochemical units.

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