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# NEWSLETTER

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## INTERNATIONAL COOPERATION

### WAN Met with American Guests

WAN Gang, Chinese Minister of Science and Technology, met with Eric Heitz, President of the US Energy Foundation on September 1, 2010 in Beijing. Both sides exchanged views on the issues of common concern. WAN expressed his appreciation to the Energy Foundation for the contributions it has rendered to the energy development in China and to the energy collaborations between the two countries through its sustainable energy projects. WAN said that it is extremely important to deepen international cooperation in the area of clean energy, facing the challenges of global climate change and energy. WAN briefed the other side of the progresses made by China-US Clean Energy Joint

Research Center, and the development of clean energy automobiles and biomass energy in China as the request of his guests. WAN encouraged American universities, industry, research institutes, and foundations to be part of the clean energy collaborations between the two countries. Heitz spoke about the progresses made by Energy Foundation China sustainable projects and collaborations with Chinese universities and research institutes in the area of new energy autos. He said that new energy autos enjoys a broad application perspective, in a close association with adapting to climate change impacts and ensuring petroleum safety, and that the Energy Foundation is willing to enhance its collaborations with Chinese partners in the area of clean energy, including new energy autos.



### Sustainable Aviation Biofuel Lab

A sustainable aviation biofuel lab, jointly established by CAS Qingdao Institute of Bioenergy and Bioprocess Technology and Boeing (China), was officially inaugurated on September 2, 2010. The new lab is designed to speed up commercial applications of sustainable aviation biofuels, supporting Boeing's sustainable aviation biofuels strategy and the needs of aviation industry, with a focus on developing algae plantation, reaping, and processing related technologies and techniques, and associated commercial applications. Before this, both parties had jointly inked an MOU to promote the collaborations on algae based sustainable aviation biofuels at the opening ceremony of a forum to discuss renewable energy and biofuels held on May 26, 2010. Both parties undersigned an accord on the same day to establish a joint lab for the purpose. According to the accord, the 3-year phase I project will have an investment worth USD 3 million. While working on algae based sustainable aviation biofuel demonstration and commercial applications, both sides will work with China National Petroleum Corporation

to develop an industrial chain, in an effort to establish a feasible and sustainable algae biofuel industry in China.

## RESEARCH AND DEVELOPMENT

### Hepatitis E Vaccine Heading for Marketplace

A recombinant hepatitis E vaccine, jointly developed by National Institute of Diagnostics and Vaccine Development for Infectious Diseases (Xiamen University), Beijing Wantai Biological Pharmacy, and Xiamen Innovax Biotech CO., LTD. (INNOVAX), has been granted with 4 domestic or international invention patents since 1998. With the support of Chinese Ministry of Science and Technology and State Food and Drug Administration, the clinical study of the recombinant hepatitis E vaccine becomes a major national research project to be implemented during the 11th Five-year Plan period (2006-2010). Phases I and II clinical trials of the vaccine were finished in 2005 at China CDC, National Institute for the Control of Pharmaceutical and Biological Products, Guangxi CDC, and Xiamen University respectively. Phase III clinical trials were made at Jiangsu CDC, Xiamen University, and National Institute for the Control of Pharmaceutical and Biological Products respectively. The experimental results, derived from 5-year R&D efforts and the participation of 120,000 volunteers, were published in the August 23, 2010 issue of *The Lancet*.

State Food and Drug Administration has accepted the new vaccine's application for the new drug certificate and production permit at the end of 2009. A factory has been erected at a biopharmaceutical park in Haicang, Xiamen, getting prepared for producing the new vaccine upon the final approval of national drug authorities.

### Largest PBmice Database in World

During the 11th Five-year Plan period, Institute of Developmental Biology and Medicine, part of Fudan University, has established an integrated database system for piggyBac (PB) insertional mutations and associated characterizations in mice, containing more than 5,000 PB insertions, or 20% of the mouse genome. The scale the database has so far reached is equivalent to the total PB insertions collected by the world biomedical community in the past 20 years, making it the largest of its kind in the world. The new database has collected 280 known mutagens concerning human diseases, 447 candidate mutagens that may trigger up diseases, 10 confirmed mutagens as a drug target, 24 possible drug target mutagens under intensive studies, 378 genes that serve as a signal pathway, and numerous genes whose functions have to be determined. The database makes a great tool for searching and validating the genes that may contribute to the occurrence of diseases or have a major physiological function, studying the mechanisms

that define life activities, establishing animal models, screening biological markers or drug targets, and developing innovative methods for diseases prevention, diagnosis, and treatment. All the mutagens in the database have been made available to the public through online PBmice.

## Improved X-Ray Imaging Technology

Not long ago, a study team, led by WU Ziyu at the University of Science and Technology of China Synchrotron Radiation Lab, found that two X-ray images made from front and rear angles present a symmetric pattern in absorption but an anti-symmetric pattern in refraction, based on a multi-year study. The discovery has led to a new X-ray positioning method. Experimental results show that the new method has overcome the downside of the so-called relative imaging positioning, allowing a simpler and faster operation with reduced radiation dosage. When working with the existing CT technology, the new method is able to offer a simpler operation with reduced radiation dosage. The finding, when published, was referred to by a reviewer as a major breakthrough in the area of X-ray imaging in the past 20 years.

## AAH Overexpression Associated with Surgical Outcomes

Thanks to 5-year painstaking efforts, a research team, led by SHEN Feng at Second Military Medical University Hepatology Hospital, reported that the overexpression of aspartyl- (asparaginyl) - $\beta$ -hydroxylase (AAH) in hepatocellular carcinoma is associated with worse surgical outcomes. Researchers made a hybridization experiment using the cDNA chips of 8 liver cancer patients who had a surgical operation, and identified AAH as the most overexpressed gene in HCC by way of complementary DNA microarray hybridization. The AAH overexpression was further confirmed in 40 liver cancer patients. A prospective study of 233 patients undergoing curative resection indicated that AAH expression was an independent factor affecting recurrence. Patients with AAH overexpression had a poorer prognosis, compared with those having an underexpression. In Barcelona Clinic Liver Cancer stage A, the tumor recurrence and survival rates of patients with AAH overexpression or underexpression were also statistically different. For example, in stage A patients with tumors measuring  $\leq 5$  cm in diameter, the time to recurrence was  $26.7 \pm 1.6$  versus  $51.9 \pm 2.8$  months, and the 1- and 3- year survival rates were 97% and 52% versus 100% and 90% in AAH overexpression and underexpression patients, respectively. It is believed that AAH overexpression in HCC is strongly correlated with worse surgical outcomes, and this molecule provides a more precise prognostic predictor in early stage HCCs. The finding was published in the journal of *HEPATOLOGY*.

## Intestine Lubricating Rice

CAS Changchun Institute of Applied Chemistry recently developed an amylose rice that lubricates human intestines. The water holding rice, made up of non-digestive amylose,

is able to prevent the outflow of water from the rice. When absorbing the water, the rice would become a water holding structure, containing the water 40 times its volume. The amylose rice can be found in digestive residues, playing three roles: 1) raising the water content of residues; 2) boosting the volume of residues. 5g of amylose rice can boost the water volume to 150 ml, enhancing intestinal emissions; and 3) preventing residues from becoming hardened.

According to a briefing, 30% of elderly people would have constipation as the result of decreased food intake, reduced physical movement, and weakened intestinal dynamics. Clinical trials of the intestine lubricating rice at Jilin University No. 2 Clinical Hospital show that the rice is valid in preventing constipation in 80% of elderly people.

### Solar Air-Conditioning Garment

A team, made up of the faculties and students at Shanghai Jiaotong University School of Mechanical Engineering, has developed a simple, practical, and environment friendly solar air-conditioning garment. The air-conditioning garment, equipped with a solar cell panel and a tiny turbo fan, is a temperature reducing equipment that can be worn on ordinary clothes. It works to accelerate air circulations and sweat evaporation on the back, reducing skin temperature.

Researchers made a demonstration at an outdoor temperature under 36°C. The solar panel on the shoulder absorbs light, and turns it into electric power, making the air-conditioning garment work. A mini turbo fan installed on the back absorbs the air from the waist up, before exhausting it from the back collar. The garment soon becomes well ventilated, like breathing.

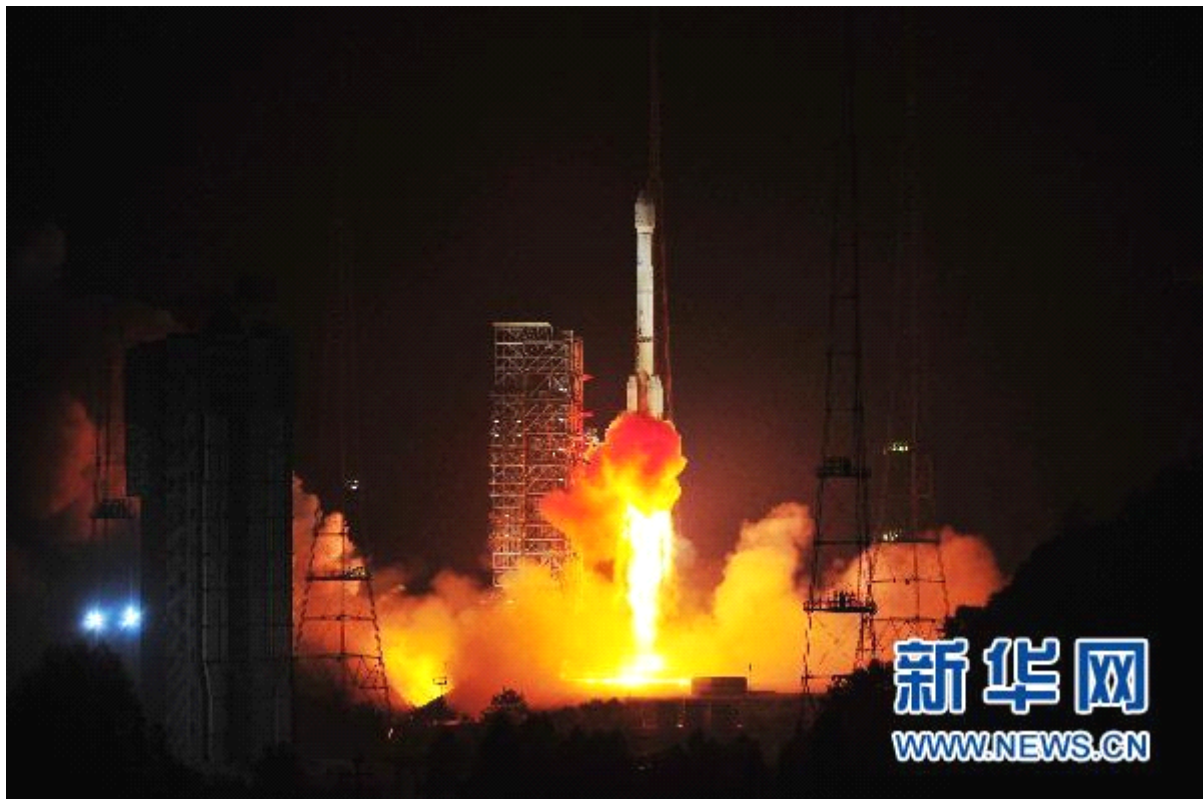
According to a briefing, the solar panel makes a clean and environment friendly energy source, compared with regular batteries. The turbo fan with a low power consumption is able to guide air to flow in a vertical manner, making a 90-degree change of the flow direction of the air absorbed from the lateral side, before exhausting the air from a skeleton-like ventilation channel, allowing the back to be ventilated in an even manner. The innovative garment can be powered by two alternative power supply modes, allowing it to work properly even in an overcast or a rainy day.

#### NEWS BRIEFS

### SinoSat VI Launched

At 0014, September 5, 2010, China successfully blasted off SinoSat VI aboard a CZIIIC launch vehicle, from the Xi'chang Satellite Launch Center. The new satellite, a telecommunication and broadcasting platform, makes a substitute for SinoSat III. The

satellite entered the preset orbit 26 minutes after the launch, and was positioned at a perigee of 213km, and an apogee of 42,061 km, with an orbit inclination angle at 25.2 degrees.



The large-volume and highly reliable satellite is designed to work on radio and TV direct broadcasting for 15 years. The Xi'an Satellite Control Center and a Yuanwang measuring boat will jointly guide the satellite to eventually sit at 126.4 degrees east longitude, and establish a proper working attitude.

### Chinese Students Won Stockholm Junior Water Prize

Three Chinese high school students from Foshan, Guangdong were honored with a special prize at the Stockholm Junior Water Prize conferring ceremony held on September 7, 2010, for their unique approach to release energy while keeping nitrogen, through remolding the soil with wastes and symbiotic bacteria. The new technique is able to realign ecological factors in the soil, keeping the soil from becoming hardened, and curbing the pollutions caused by farming activities. The Jury said in a statement that the three Chinese students have worked on a project fully in line with the water quality theme defined for the World Water Week in the year, and the findings are helpful for addressing some most urgent issues in farming activities. HRH Crown Princess Victoria of Sweden conferred the prize certificates to the Chinese winners.

## SOFC Progresses

A solid oxide fuel cell (SOFC) system, developed by Huazhong University of Science and Technology Fuel Battery Research Center, started to power electric fans and bulbs as an independent power generation system on September 3, 2010. The Center has been working on SOFC materials, preparation, test, and system integration for many years, and has rolled out a range of sub-systems for SOFC piles, gas supply, thermal management, control unit, and AC-DC conversion.

## Mobile Lab Passed Approval Check

An expert panel, organized by Chinese Ministry of Science and Technology, nodded its approval on August 20, 2010 to a national key lab on mobile telecommunication sitting at the compound of China Academy of Telecommunication Research. The expert panel listened carefully to the Academy's report, and visited the physical lab. Experts believed that the lab has been working on the nation's strategic mobile telecommunication needs, with a focus on the new generation mobile telecommunication technologies and SoC chips, including TD-SCDMA, TD-LTE, SCDMA, and Mcwill. In this context, the panel justified the approval check.

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