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NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUES

Top Ten Domestic S&T Events

Top ten domestic S&T events for 2006, selected by a number of academicians of the Chinese Academy of Sciences and major media agencies under sponsorship of the Science and Technology Daily, were unveiled on December 25, 2006 as follows:

1) Genetic chip and expression maps for domesticated silkworm

The Key Lab for Sericultural Science, a part of China Southwest University, made the debut of its genetic chips and expression maps for domesticated silkworm on January 2, 2006. The event heralds a major breakthrough in China's sericultural research. It will eventually open up an innovative approach for domesticated silkworm breeding and human disease control.

2) New particle discovered on Beijing Positron and Electron Collider

Institute of High Energy Physics under the Chinese Academy of Sciences, and the University of Hawaii jointly announced on January 6, 2006 that a new particle had been observed on the Beijing Spectrometer, part of the Beijing Positron and Electron Collider. Scientists believe that the new particle is the one that people have been trying to capture in high physics experiments in the past several decades.

3) National S&T conference decides to enhance proprietary innovation capacity

A national S&T conference was convened on January 9, 2006 in Beijing. The CPC Central Committee and the State Council have made the decision to implement the National Outline for Medium and Long Term S&T Development Planning (2006-2020), with an array of strategic endeavors for enhancing China's proprietary innovation capacity, and making it an innovation country. The State Council issued on February 26, 2006 a support policy for implementing the National Outline for Medium and Long Term S&T Development Planning (2006-2020), in which a policy system is crafted out for facilitating proprietary innovations.

4) Chinese scientists rolled out genetic engineered vaccine for foot-and-mouth disease

On February 22, 2006, a genetic engineered vaccine for type O foot-and-mouth disease, developed by the Fudan University and its collaborators, passed the accreditation. The new vaccine is designed with a technology to produce the vaccine without calling for a large quantity of foot-and-mouth viruses. As a result, the product itself is safe and pathogenic elements free.

5) China builds the world largest somatic cell bank for stock and poultry

China announced on April 13, 2006 that it has established a somatic cell bank for stock and poultry, the largest of its kind in the world. In today's world, where bioresource and biodiversity protection becomes a global concern, Chinese scientists have to create a somatic cell bank for protecting endangered stock and poultry species, through preserving their genetic resources.

6) Qinghai-Tibet Railway runs through

Thanks to the painstaking efforts of more than 100,000 people in a period of five years, the section from Ge' ermu to Lhasa, part of the Qinghai-Tibet Railway was completed of its construction on July 1, 2006. The event makes the plateau railway, the highest and longest one in the world, run through possible.

7) Proprietary LONGXIN IIE CPU accredited

LONGXIN IIE, a CPU chip developed by the Institute of Computing Technology, part of the Chinese Academy of Sciences, passed experts' accreditation on September 13, 2006. The development is a critical step made by China in the area of information.

8) Chinese scientists found the key to regulating plant growth

A research team of China Agriculture University has discovered for the first time an ABA receptor, a protein involved in chlorophyll synthesis. It improves people's understanding of the key mechanisms for regulating stomatal movement and seeds development. The finding was published in an October issue of the journal *Nature*.

9) China becomes part of ITER

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ITER is a large international engineering project, with a scale only next to the International Space Station. Being part of the project is China's largest effort so far made in international S&T collaborations.

10) China's first AIDS drug formulas

Latest results, derived from a study initiated by the national authorities in the 10th Five-year period (2001-2005) for treating Chinese AIDS patients, show that Chinese made AIDS drugs have produced a therapeutic effect matching their imported counterparts, with same occurrences for adverse reaction. So far two optimized formulas have been screened out. Clinical trials have shown that home made AIDS drugs are therapeutically safe and effective, inhibiting AIDS viruses and improving patients' immune functions.

New Focus for Software Industry

It is reported from a national software meeting held not long ago that the Chinese Ministry of Information Industry (MII) will make embedded, generic, and information security software a major development direction for China's software industry in the 11th Five-year period (2006-2010).

According to a briefing, MII will support the development of embedded software, a growth point for China's information industry, through a special fund and tax incentives. Of the first 10 businesses sitting among the top 100 domestic software makers in 2006, 6 are the manufacturers of embedded software.

Generic software makes another priority. Generic software, featured with high thresholds and profits, makes a base and lead for developing new software technologies, and has become a focus for competition between the software and information service industries. China's software industry will work mainly on operating systems, developing an array of generic software, including operating system, database management, and mediumware. Information security software also makes an important area for proprietary innovations, which is important for establishing a proprietary and controllable support system for information security.

RESEARCH AND DEVELOPMENT

Proprietary Innovations for GM Crops

A project, approved by the State Council for genetically modified crops and associated commercial applications, has been implemented in a smooth manner, according to an accreditation meeting held not long ago by the Chinese Ministry of Science and Technology. The project has worked on a range of topics, including functional genes cloning, novel GM materials, innovative core GM technologies, new products and associated commercial applications, safety assessment of GM crops, and GM platforms. The project, since its implementation in 1999, has consumed a government appropriation worth RMB 510 million, and a fund raised by government agencies, localities, and private sectors amounting to RMB 320 million.

In the area of isolating and cloning major functional genes, researchers have freed themselves from dependence on imported target genes, through screening out 610 new genes, including 46 proprietary new genes enjoying application perspectives, such as rice tillering and herbicide resistance. Researchers have established a safe and efficient GM technical system for major crops, flowers, and trees, including cotton, rice, rape, corn, soybean, peanut, and poplar. Derived from the efforts are 20,925 new varieties and 58 new species for rice, corn, wheat, cotton, rape, soybean, and major trees and grasses, featured with genetic resistant to pests, diseases, herbicides, and adversities, with fine quality.

To ensure the biological and environmental safety for genetically modified crops, researchers have worked out an array of techniques that can be used to assess the safety of GM crops, in line with national laws and regulations. 473 new GM crops and materials have been or are being assessed of their biosecurity, of which 58 for commercial applications, 114 environmental release, 199 pilot study, and 102 experimental production.

In the past 6 years, the project has produced 2,481 high caliber personnel, including doctoral and master's students, 481 domestic or international patent applications and grants, and 1,992 papers, of which 425 have been collected by SCI and EI.

Thanks to 7-year efforts, China has established a well functioned national R&D system for GM crops, including national centers for GM crop research, and bases for pilot experiments and commercial applications, which creates infrastructures and technical platforms needed for GM crops research and seeds breeding. National GM crop research centers, focusing on functional genes and equipped with world-class instruments, equipment, and experimental conditions, have been established in Beijing and Wuhan respectively, in an attempt to provide the sustained support for China's research of crop functional genes. Advanced national bases for GM crops pilot experiments and commercial applications, focusing on GM breeding, have been established in Jilin and Henan respectively, to offer a sustained technical support for China's pilot experiment and commercial applications of GM corn, soybean, and cotton.

Human Brain Works Separately

A research team, led by Prof. CHEN Lin with the Institute of Life Sciences, part of Chinese University of Science and Technology, has reached a finding, through studying Chinese identifying different intonations of Mandarin, that there is a 200-millisecond early perception phase when sound entering human ears, and Mandarin intonations, like music, are mainly processed through the right hemisphere of human brain. The finding, published in the online Proceedings of the *National Academy of Sciences* on December 19, 2006, also suggests that Chinese who speaks Mandarin uses his or her right brain more frequently, compared with the western counterpart who speaks English, which implies that the potential of right brain needs to be further tapped up.

Prof. CHEN and his collaborators studied brain's early perception of hearing, using Mandarin intonations, which have some similarities to both music and meanings of a language. They found that there is an early perception phase, as assumed by the acoustic scenario, and there is also an attention perception phase in a later stage, as expected by the function scenario. Based on experimental results, researchers developed a two-level hearing cognition model, combining both acoustic and function scenarios. The model shows that in the pre-attention phase, the right brain is a privileged hemisphere for handling Mandarin intonations, through acoustic input. In the attention phase, the left brain becomes a privileged hemisphere handling Mandarin intonations, through input meanings. The finding shows the division of work of two brain

hemispheres in handling language perception.

Pig Cloned with Green Fluorescent Protein

A research team, led by Prof. LIU Zhonghua of China Northeast Agriculture University, made the debut on December 22, 2006 of a GM pig cloned with green fluorescent protein (GFP), the first of its kind in the country. The development makes China fourth country in the world cloning a pig with green fluorescent proteins, following the United States, South Korea, and Japan.

Researchers extracted green fluorescent proteins from a special jelly fish, before feeding the processed genes into the genome of embryos' fibroblasts. After that, they transplanted the cell nucleus of GM somatic cells into the enucleated mature egg cells to foster GM embryos. The GM embryos were embedded in receptor sows through operation. The 114-day pregnancy has resulted in a GM pig with green fluorescent proteins.

At present, another two sows, conceived with GM embryos, are expected to give birth in the mid-January 2007. The sows have been transplanted with myostatin genes, which made them no longer possess the genes inhibiting the growth of muscles. The process speeds up muscle growth, and raises the productivity of pig breeding.

Proprietary Straw Power Generator in Operation

A home made straw burning power generator, the first of its kind in the country, was put into operation on December 20, 2006 in Suqian, Jiangsu. With an investment of RMB 248 million for the phase I development, the proprietary straw burning power plant will consume 170,000-200,000 tons of straw a year (98,000 ton-coal-equivalent), to reach an annual generation capacity of 132 million kilowatt hours. The project will add RMB 50 million in the wallets of local farmers.

The demonstration project covers an area of 50 km, made up of some 500 natural villages. A villager, who produces 7.2 tons of straw a year from growing crops, can make extra RMB 1,440, if he or she sells the straw to the power plant.

China is rich in straw resources. Rational and full utilization of straw resources can lessen the demand for other energy resources. Taking advantage of the straw resources unutilized (140 million tons a year) for power generation can lead to a saving of some 100 million ton-coal-equivalent (TCE) each year.

NEWS BRIEFS

MOST and Tianjin Join Hands on Biopharmacy

Tianjin International Research Center for Biopharmaceutical, a joint venture financed by the Ministry of Science and Technology and Tianjin Municipality broke ground on December 19, 2006.

According to a cooperation agreement signed in June 2006, between MOST and Tianjin Municipality, an international biopharmaceutical park will be established in the Binhai New Area, Tianjin, through concerted efforts. The Tianjin International Research Center for Biopharmaceutical makes the core of the new industrial park.

Based on half-year preparation, the Biopharmaceutical Research Center is launched in the first place, with a budget of RMB 1 billion, mainly for physical construction and R&D activities in the first 5 years.

XU Guanhua, Chinese Minister of Science and Technology, said at the ground breaking ceremony that the construction of the International Biopharmaceutical Park and its Biopharmaceutical Research Center will play an important role in spurring up the development of biopharmaceutical industry not only in the Bohai Area, but also in the country.

High Technology Create 940 Billion

It is disclosed at a national meeting recently held to discuss high-tech development that China's high-tech industry has produced an added value worth RMB 940 billion in 2006, with a 20% growth compared with the same period. In the same year, China's tech products import and export has hit USD 520 billion, or 25% up compared with the same period, of which export exceeds USD 270 billion, or 28% of the nation's total export volume.

ZHANG Xiaoqiang, Vice Minister of State Development and Reform Commission, told reporters that China's high-tech industry will focus on the following eight priority areas in the coming year: 1) enhancing the capacity building of innovation infrastructures; 2) establishing a technology innovation system led by industry; 3) supporting R&D of major equipment and industrial technologies; 4) promoting commercial application of high technologies; 5) facilitating the development of major industries; 6) accelerating the construction of industrial basis for high technologies; 7) advancing the construction of e-government, and ensuring information security; and 8) spurring up the development of e-commerce, and facilitating the development and utilization of information resources.

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