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# NEWSLETTER

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## SPECIAL ISSUES

### More High Caliber Overseas Talents Needed

Not long ago, a coordination panel, established by the Chinese government to attract high caliber overseas talents, has decided to launch a new program to introduce more high caliber overseas talents into the country. The program is designed to introduce strategic scientists and R&D leaders able to land breakthroughs in developing key technologies, developing high tech industry, and initiating new disciplines, in line with the strategic development goals defined by the country. Major national innovation projects, state enterprises under the jurisdiction of government agencies, state owned banking institutions, and industrial parks headed by high tech parks, will be encouraged and supported to introduce more high caliber overseas talents. Qualified state enterprises,

universities, research institutes, and national high tech parks will be allowed to establish special industrial bases to accommodate high caliber overseas talents, in an attempt to foster a closer tie between industry, universities, and research institutes, introduce the scientific research and R&D modes up to the international standards, and build a contingent made up of high caliber overseas talents. According to the program, the Chinese government will continue support the existing talent programs, including Cheung Kong Scholars Program, Hundred Talents Program, and National Outstanding Young Scientist Foundation. At the same time, special programs will be initiated to attract high caliber overseas talents urgently needed by industries. Provinces, municipalities, and autonomous regions are asked to establish their own talent mining plans to attract high caliber overseas talents, in line with the economic and social development and industrial structure readjustment in the locality. Developed regions, especially the east coastal areas and central cities, are encouraged to attract high caliber overseas talents to work for some special projects in high tech parks, overseas Chinese pioneering parks, and campus S&T parks.

## 211.4 Billion S&T Expenditure in 2007

A statistics bulletin, jointly issued by the State Statistics Bureau, Ministry of Science and Technology, and Ministry of Finance, shows that China's S&T expenditure has sustained a steady growth in 2007, with the nation's R&D expenditure in the year reaching RMB 371 billion, or RMB 70.7 billion more compared with the preceding year. The 23.5% growth has raised S&T expenditure to 1.49% as a proportion of GDP, a new a historical high. State treasury allocated an appropriation worth RMB 211.4 billion for S&T activities, or RMB 42.5 billion up against the preceding year, with a growth of 25.2%, and 4.25% as a proportion of the total government appropriations in the year, the highest since 1998.

Of the said R&D expenditures, industry secured a portion worth RMB 268.2 billion, research institutes under government agencies RMB 68.8 billion, and universities RMB 31.5 billion, at 72.3%, 18.5%, and 8.5% respectively. Industry has raised its share by 1.2% compared with the preceding year, indicating enhanced investments in technology innovations.

RESEARCH AND DEVELOPMENT

## New Insulin Resistance Tricks Found

A study group, led by PEI Gang at CAS Shanghai Institutes for Biological Sciences, reported its new insulin resistance finding in the recent issue of the journal *Nature*. The new finding expects a potential therapy for treating diabetes.

Researchers found that the human body is designed with a structure called protein messengers. The messengers, or  $\beta$ -arrestin-2, are able to communicate and fuse with insulin, producing a new  $\beta$ -arrestin-2 signal complex. As the core of the signal complex, protein messengers have ties with both insulin receptors and kinase signal molecules, and are able to couple the latter two to enhance the body's sensitivity to insulin and to sustain a normal metabolism process. Loss or dysfunction of  $\beta$ -arrestin-2 results in deficiency of this signal complex and disturbance of insulin signalling, thereby contributing to the development of insulin resistance and progression of type 2 diabetes. Researchers also found that rats with type 2 diabetes have noticeably reduced expression of  $\beta$ -arrestin-2, and that feeding the needed protein in such rats can effectively ease insulin resistance and associated symptoms.

### World First Plant Chromosome Atlas

CHEN Ruiyang and coworkers at Nankai University have recently published a plant genome chromosome atlas, the first of its kind in the world. The atlas has collected the chromosome data of some 4,000 economic plants found in China during the period of 1978 - 2008, with the age of the precious wild plant species exceeding 5,000 years.

The atlas, consisting of 5 volumes, depicts the chromosomes of Chinese fruit trees and their wild kinships, Chinese crops and their wild kinships, Chinese flowers, bamboos, and medicinal plants. It takes 30 years for CHEN Ruiyang and his coworkers to compile the atlas, through arduous field collection, study, and consolidation. The atlas has basically covered the chromosome data of all cultivated and wild plants and their kin species in China. Meanwhile, researchers found 271 new polyploids, polyploid complex, and cell type of economic and scientific values.

### Stomach Vaccine Passed Phase III Trials

Thanks to more than a decade painstaking efforts, a study team, headed by Prof. ZOU Quanming at No. 3 Military Medical School, has rolled out a grade I new drug for preventing stomach diseases. The proprietary oral recombinant H pylori vaccine has completed its Phase III clinical trials, the first of its kind in the world so far has reached such an advanced trial phase. Applicable to all the populations, the new vaccine can, through only one oral administration, help people to reduce the attack of a range of stomach diseases caused by H pylori, including gastritis, gastric ulcer, duodenum ulcer, and even stomach cancer and lymphoma.

### Domestic Rabbits with Human Genes

Not long ago, Xi'an Jiaotong University has established two domestic GM rabbit models

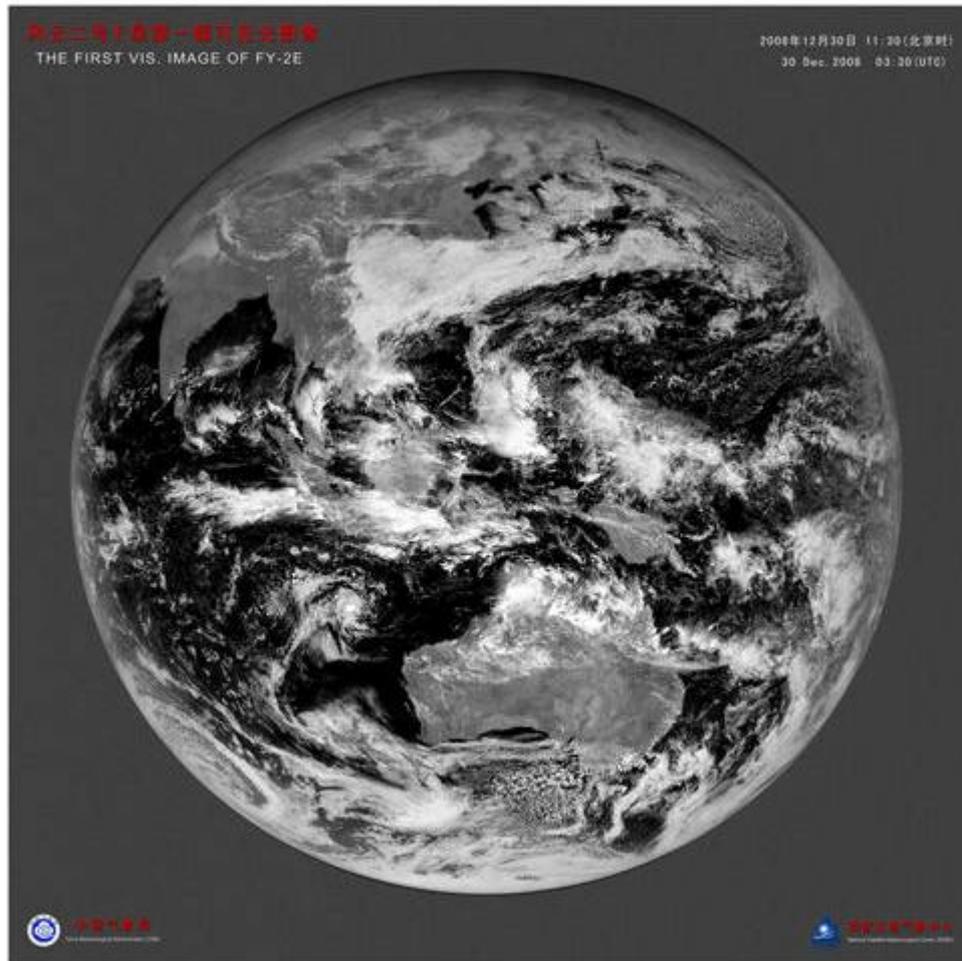
carrying apoC-III and PGC-1. Molecular biology tests show that both GM species have carried exogenous apoC-III and PGC-1 genes. The GM rabbits, conceived with human genes using a technique similar to cloning, have survived for more than 40 days. They, 48 in total, are featured with a high blood fat level that is 5 or 6 times the normal domestic rabbits.

## Full cDNA Database for Bamboo

Chinese Academy of Forestry Science, in collaboration with International Center for Bamboo and Rattan and CAS National Gene Center, has established a full length cDNA database for bamboo, containing some 10,000 precisely sequenced genes. Meanwhile, researchers have made some statistical information available for bamboo, including GC content, code preference, simple sequence repeat, small-molecule RNA, and transposon. Additionally, researchers analyzed the system development tree based on the homologous genes identified from 42 crop groups. Analysis results show that bamboo has a closest evolutionary tie with paddy rice. As part of the bamboo genome sequence, researchers have established two high quality BAC database enjoying an extensive coverage, provided a solid ground for a full-fledged bamboo genome sequence in the future.

NEWS BRIEFS

## FY-II-E Satellite Sent Back First Visible Cloud Image



CMA National Satellite Meteorological Center received the first visible cloud image from FY-II E satellite at 11:30, December 30, 2008. The development indicates the smooth operation of the satellite and a fine coordination established between the satellite and the ground control. It also implies that the new satellite and the ground control system have entered a matured development phase.

One can see in the image a multi-layered static front cloud structure above South China, an upper air jet cloud system closely associated with cold air activities, a cell like cloud system after cold air entered oceans, and the snow cover on the Tibetan Plateau. Comparing with the similar cloud images sent back from FY-II C and D satellites, the cloud image received from the new satellite shows richer layers and improved scattering radiation.

## China Expedition Reached Dome A

After a 20-day arduous journey of 1000km, China's 25<sup>th</sup> Antarctic expedition team and the cargo they carried with them has safely reached Dome A, the highest point of the inland ice

cover in the pole, at 02:55, January 7, 2009 (Beijing time). It is the third time for China's expedition team to have reached the Dome.

Sitting on an elevation of 4,093m above sea level, Dome A runs 1,250 km to the Zhongshan Station. When the 28-member team arrived at the Dome in 40 packed sledges driven by eight snow trucks, the local temperature has reached 36.5 ° C below zero. All the stuff needed for building a new station, logistics, and daily consumption, has safely reached its destination. The expedition team will place a bronze sculpture, the symbol of the Kunlun Station, on the Dome. China Antarctic Kunlun Station, physically sitting on Dome A with an elevation of 4,087m, will be China's first station built in the inland of the Antarctica, only 7.3 km away from the highest point of the inland ice cover.

### Improved Solar Cells

A national pilot project to develop the techniques and equipment needed for producing CuIn1-xGaxSe2 thin film solar cells at the Binhai New Area in Tianjin has rolled out a CuIn1-xGaxSe2 thin film solar cell component with an effective area of 804 cm<sup>2</sup> and a photo-volt conversion rate of 7%. Thanks to many-year efforts, researchers have established an experimental platform up to the international standards for developing thin film deposition equipment and needed key technologies. Financed by an array of investors, the pilot project has completed the construction of workshops and facilities and developed needed key technologies. The efforts have cumulated massive scientific data and experience for future improvements.

### Auto's Intelligent Laser Eye

A laser based intelligent collision prevention system, developed by a study team led by CHEN Qian at Nanjing Polytechnic University, has recently passed an approval check. Applied with a range of advanced laser, mechanical, electric, and signal technologies, the novel system is designed to directly collect safety data of moving vehicles, and to automatically issue warning, gear down, and brake in line with the risks it detects. According to experts, the laser eye embedded in the system detects risks faster than human eyes, ensuring risk avoidance well in advance. Experiments show that one minute earlier risk detection, together with right measures, is able to fend off 90% of the pileup accidents.

### Water Surface Cleaning Boat

A cleaning boat, jointly developed by Shanghai Water Environment LLC., Shanghai Marine University, and CSIC No. 704 Institute using the built-in technology, launched on December 23, 2008 its maiden journey on the Huangpu River. With a length of 26.5 m, and

a tonnage of 92 tons, the new boat, designed to meet the clean water environment needs of the Shanghai Expo, is able to clean 72,000 square meters of water surface an hour. The boat, equipped with an efficient built-in automatic cleaning, collecting, and storing system, will be used to automatically collect, store, and ship water garbage and aquatic plants up to a volume of 4 cubic meters.

## Novel Coal Flame Retardant

A research team, led by TAN Yunzhen of Shandong Science and Technology University, has successfully developed a novel coal dust flame retardant in the course of studying the physical and chemical properties of coal dust. According to a briefing, the high molecule coal dust flame retardant is toxicant and harsh odor free, imposing no erosion to human skin and facilities. It also enjoys numerous merits, including a reduced dosage, enhanced efficiency, and the low cost at RMB 5-7 per ton. Without needing special equipment, it works simply by adding the flame retardant in the water for suppressing coal dust. Experiments show that the retardant is able to shorten the length of flames in dust explosion, noticeably compromising the explosion potentials of coal dust.

## Largest Grid Solar Power Station in China

The Haixi Menggu Tibetan Autonomous District, part of Qinghai Province, recently inked an accord with China Technology Group and Qinghai New Energy Group to build a GW-level grid solar power station in Qaidam Basin, Qinghai. The Initial Phase of the project will build a 30MW solar power station in 2009 with a budget worth RMB 1 billion. The completion of the phase I project will make the new station the largest grid solar power facility in the country. The solar power station, equipped with a photovoltaic cell array made up of non-crystal thin films and crystal silicon, is designed with a total capacity of 1GW (1000MW). Enjoying 3,000 sunshine hours a year, Qaidam Basin ranks second only next to Tibet in terms of annual radiation and sunshine. It is a most desirable region for the comprehensive utilization of photovoltaic resources in the country.

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