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SPECIAL ISSUE

S&T Supports Five Major Areas in New 5-Year Plan

WAN Gang, Chinese Minister of Science and Technology, briefed on April 2, 2011 the media about the planned S&T objectives in the 12th Five-year Plan period (2011-2015), at a press

conference sponsored by the State Council Office of the Press Secretary. WAN said during the 12th Five-year period, China will make science and technology development a strategic priority, with the full-fledged implementation of the tasks defined by the national S&T plan, striving to change the outdated economic development mode using the momentum of science and technology advancement.

First, China will accelerate the implementation of major science and technology projects, fostering and developing the emerging industries with strategic importance, making the implementation a major handle to boost the emerging industries with strategic importance, and a starting point to deepen the S&T reform, striving to achieve major landmark accomplishments.

Second, China will deploy its basic and cutting edge research activities in a visionary manner, aiming at the cutting edge technologies, mastering the core and key technologies, occupying the strategic high ground, optimizing the distribution of basic research activities, promoting the balanced development of basic disciplines, facilitating interdisciplinary research activities, and supporting emerging cross-disciplinary activities.

Third, China will accelerate the transformation of traditional industries using high and new technology. Efforts will be made to promote the information process of manufacturing industry, develop energy-saving and environmental protection industry, and facilitate the transformation of traditional industries and the revitalization of major industries. Efforts will also be made to accelerate the development of creative industries, R&D design and service, modern logistic industry, and knowledge/technology intensive industries.

Fourth, China will enhance innovation activities in agriculture and in the rural areas, implementing food yield boosting projects, accelerating the development and diffusion of modern farming technologies featured with high-yield, high quality, efficient, ecologically friendly and safe, and raising the overall capacity of agricultural activities. Efforts will also be made to implement a range of S&T actions, including clean rural communities, rural information process, and S&T envoys, and to establish a novel S&T service system in the rural areas.

Fifth, China will build up its capacity to improve people's livelihood, enhancing R&D activities and demonstrations in the areas of population, health, environmental protection, public safety, disaster prevention among others. Efforts will be made to prepare appropriate S&T action plans to deal with global climate change, and to strengthen the study of scientific and technological issues in climate change.

INTERNATIONAL COOPERATION

WAN Visited Australia and New Zealand

At the invitation of Australia and New Zealand Governments, WAN Gang, Chinese Minister of Science and Technology (MOST), paid an official visit to the two countries from March 20 to 29, 2011.

During his visit to Australia, WAN met with some government ministers and governors, and witnessed the signing of a renewed MOU between the MOST and the New South Wales government, and a renewed S&T cooperation MOU between the MOST and the Queensland government. WAN said the S&T cooperation between China and Australia has yielded rich fruits, hoping bilateral efforts will be made to advance the construction of the Joint Research Centre, promoting collaborations between industry, universities and research institutes in a range of areas, including new energy vehicles, energy conservation, and environmental protection.

During the same visit, WAN delivered a keynote speech at the Hall of Science on China's S&T development and bilateral collaborations between the two countries. He also visited some universities and institutions, including the University of New South Wales, Australian National University, University of Melbourne, Swinburne University of Technology, University of Queensland, the Commonwealth Scientific and Industrial Research Organization, DSIH among others.

During his visit to New Zealand, WAN met with government ministers, and had a roundtable talk with the heads of S&T community. He also visited the University of Auckland, and met with Chinese scholars and students in the locality. WAN thought highly of the accomplishments stemmed from the bilateral scientific and technological cooperation, and reached consensus with his counterparts on the long-term bilateral cooperation in the areas of life sciences, food safety, water pollution control, earthquake engineering among others.

China's First Voluntary Carbon Reduction Transaction

China's first voluntary carbon emission reduction transaction was made on March 29, 2011 in Beijing, under a CDM capacity building pilot project, jointly financed by the French Global

Environment Fund and the French Development Agency, and implemented by China's Agenda 21 Management Centre. Yunnan Mengxiang Bamboo sold to Franshion Properties (China) Limited 16,800 tons of voluntary carbon emission reduction under the Panda Standard, through Beijing Environment Exchange. Representatives from the French Development Agency Beijing Office and China's Agenda 21 Management Center, the organizers of the activity, attended the signing ceremony.

Panda Standard, the first voluntary carbon emission reduction standard in China, is mainly designed to accommodate the emission reduction projects in agriculture, forestry, and other land-use activities. According to the accord, the bamboo forest carbon sequestration project in Xishuangbanna, Yunnan will achieve a bamboo carbon emission reduction target of 10,000 hectares. The transaction makes a good start for the efforts. As the first transaction made under the Panda Standard, the event also marks the development and growth of the voluntary carbon emission reduction market in the country.

Defected Maternal Mitochondria Makes Hypertension

A research team, headed by Prof. GUAN Minxin at Zhejiang University, in collaboration with WANG Shiwen, an academician at the PLA General Hospital, Cincinnati Children's Hospital, and Medical University of Vienna, found that defected maternal mitochondria makes a pathogenic cause to essential hypertension.

Statistics show that China has 200 million people falling under the category of hypertension, with a marveled annual growth at 10 million new hypertension patients per year. 95% of the hypertension patients are diagnosed as essential hypertension. Researchers investigated a family with essential hypertension history in the Hongdong County, Shanxi Province, and found that the family essential hypertension history has the typical characteristics of a maternal heritage. In the large family made up of 108 members from five generations, 15 of the 27 maternal relatives had a blood pressure record higher than 140/90 mm Hg, compared with 7 of the 81 non-maternal members. Further study also indicates that these patients had a mutated mitochondrial genome that resulted in a defected mitochondrial respiratory chain, which in turn led to a reduced energy supply and a raised level of oxygen free radical, causing high blood pressure.

The finding made the defected mitochondria correlated to hypertension for the first time in the world, explaining the pathogenesis of maternal inheritance, and providing a new theoretical basis for the early diagnosis, intervention and prevention of hypertension. The finding was published in the recent issue of *Circulation Study*.

Earliest Angiosperms Eudicots Found in China



A group of scientists from Shenyang Normal University, Jilin University, CAS Institute of Plant Physiology and Ecology, the Indiana University, and the University of Florida have recently found the first intact fossil of angiosperms eudicots, or *Leefructus*, in the central part of the Yixian Cretaceous Formation in Lingyuan, Liaoning. Dated back to some 124 million years ago, and very close to today's Ranunculaceae in resemblance, the ancient eudicots is the earliest fossilized angiosperms associated with the evolution of today's angiosperms found in China and in the world as well. The finding was recently published as a cover story in the journal *Nature*.

The fossil shows the above-ground portion of a mature plant. A single stem leads to five leaves, and one leads to a fully developed flower. Leaves are innervated by branching veins, and the small, cup-shaped flower has five petals. The analysis of the plant's form makes scientists believe that *Leefructus* should be placed among the Ranunculaceae, an old family of eudicots that includes buttercups and crowroot plants. SUN Ge, head of the team, pointed out that the branching relationships of the tree for this group suggested that

several families of flowering plants had already begun to diverge at least in the middle of Lower Cretaceous prior to 125 million years ago, or some 10 million years earlier than previously thought.

RESEARCH AND DEVELOPMENT

Chinese Scientists Found Main Cause of Low NT Rate

A team, led by LI Jinsong at the Institute of Biochemistry and Cell Biology, part of CAS Shanghai Institutes for Biological Sciences, has developed a 4N embryos compensation technology. Researchers found that two 4N embryos would result in a higher developmental rate of clones after aggregation, and that even a higher NT efficiency is achieved after aggregating cloned ICMs with 4N embryos. Meanwhile, the aggregated placentae display better histology and gene expression patterns. They also proved that cloned trophoblast cells constitute the main cause for the low success rate of NT.

LI and coworkers believe that the tetraploid (4N) embryos technology could significantly raise the effective birth rate of cloned fetus, if re-programmed abnormal cells did exist in the trophectoderm of blastocysts, which would lead to the failure of cloned fetus. Researchers separated the ICMs from cloned blastocysts and aggregated the cloned ICM with two fertilization-derived tetraploid embryos, and found that the full-term development of cloned ICMs was dramatically improved by 2.6 times. However, the abnormal cloned trophectoderm cells were still seen in the extraembryonic tissues in the experiment, which would have a negative impact in the fetal development. Researchers predicted that the trophoblast cells in the cloned blastocysts should be replaced by the cells from tetraploid embryos, in an attempt to raise the success rate of somatic NT. They used an immunity surgical method to remove the trophectoderm cells from blastocysts, and aggregated the separated inner cells with two tetraploid embryos, which resulted in a raised birth rate of the cloned animals by 6 times. Finally, they made a reverse experiment, aggregating the inner cells of the normal blastocyst with two tetraploid embryos, generated a birth rate similar to the one from the direct nuclear transfer. The finding, proving that the reprogrammed abnormal cells exist in the trophectoderm of blastocysts, and affect the fetal development, is important for nuclear transfer studies, and provides important theoretical evidence for raising animal cloning efficiency, and for the application of nuclear transfer technology in the areas of population and health (therapeutic cloning).

The finding was published in the April 8 issue of *Cells-Stem Cells*.

New Antibody for Rabies Virus

Not long ago, researchers at a military medical institute in Nanjing and the Nanjing Medical University have jointly rolled out a new antibody (Fab) able to neutralize the activity of rabies virus. Animal experiments show that the combination vaccine effectively inhibits rabies virus infections, a potential application desirable for rabies prevention. The finding was published in the recent issue of *J. Chinese Pharmacology*.

The study is part of the efforts to improve the therapeutic treatment of human rabies virus through neutralizing the antibodies. Researchers screened out a single chain antibody having anti-rabies virus antibody from the human rabies virus bank, and cloned the genes in the mutation region, using the splicing and extension technique. The gene, named Fab, has been tested in animal experiments. Rabies virus in vitro and in mice experiments show that the combination vaccine having Fab antibody can effectively inhibit rabies virus infections, desirable for rabies preventions.

High Quality 3D Video Conversion Chip

Tsinghua University recently announced that it has rolled out a 3D video chip named Qing-Cube, applicable to high-quality video conversion from plane to three-dimensional images. The home made 3D TV equipped with the proprietary chip will be sold in the marketplace July this year. Meanwhile, a range of 2G and 3G products, including 3D video set-top box and naked eye 3D TV, will make their debut in the coming three years.

At a launch event, Tsinghua made debut of an array of products equipped with Qing-Cube chips, including Haier 3D smart TV, Changhong 3D TV, high-definition 3D set-top box, and 3D cell phones. It is learned that a 3D TV that will be sold by a well-known domestic appliance vendor in the market July this year is a fully proprietary Chinese made 3D TV. The 3D TV that has to be watched using a pair of 3D glasses at a cost of RMB 300-1000 is the first generation Qing-Cube product. According to a briefing, Tsinghua has been working on 2nd and 3rd generation chips. 2G chip will be embedded in a set-top box, allowing people to view 3D programs on a regular LCD television set with the help of a pair of red-and-green glasses worth less than 1 dollar. A 3G Qing-Cube chip will allow people to view 3D TV programs simply through naked eyes.

200m Underwater Welding

It is reported from Shandong Academy of Sciences Institute of Marine Instrumentation that China has developed the key technology to allow people welding in a deep ocean environment. The successful development of 200-meter deep-sea welding technology and associated submersible welding unit provides a strong technical support to a range of businesses that need the technology, including marine engineering, oilfield development, and deep-sea submersibles making. The Institute is assigned to develop deep sea welding technology, a national major project under the National 863 Program, during the 11th Five-year period (2006-2010). Researchers developed proprietary deep sea welding technology and associated submersible welding unit, through the absorption and digestion of imported technologies.

The Institute plans to build an industrial center for manufacturing marine welding equipment, the first of its kind in the country, covering the materials, equipment and services needed by deep sea welding activities. The industrial center, once completed, will produce 500 tons of flux cored wire, 400 tons of welding rods, 400 tons of wet cutting rods, 500 sets of underwater welding and cutting equipment, and 10 sets of automatic titanium alloy welding equipment for underwater welding on an annual basis. The production capacity will basically meet the needs of marine resources development, providing technical support to nuclear power generation, ports and bridge construction, shipbuilding, and national defense.

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